SUMMACUT® SERIES

User's Manual
Rev 006

FCC Notice

The SummaCut-series cutters have been tested and found to comply with the limits for Class A digital devices, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. The cutters generate, use and can emit radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.
Operation of the cutters in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Caution!

Changes or modifications not expressly approved by Summa, which is responsible for FCC compliance, could void the user's authority to operate this equipment.

DOC Notice

The SummaCut-series cutters do not exceed the Class A limits for radio noise for digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

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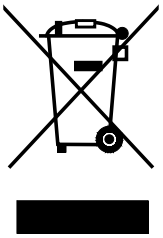

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http://www.summa.be/registration.html

Contact Information

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SUMMACUT®

Welcome

Congratulations on your purchase of the new cutter!

The SummaCut cutters are made for sign-makers.

SummaCut is Summa's most popular and affordable line of vinyl cutters.

They offer tracking accuracy, speed and features not found in other affordably-priced cutters.

SummaCut now offers the unrivaled Optical POsitioning Sensor OPOS X.

This manual is a reference guide for installing and operating the SummaCut series cutters.
Minimum revisions needed for this manual:
Firmware cutter : 026 (MD9985)
Cutter Control version 5.1 (installed from Cutter Tools version 2.2.0)
USB driver: version 6.4

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1 Setup

1.1 Unpacking the Cutter

NOTE: Save the shipping box and any other packaging items in case the cutter needs to be shipped. Do not ship the cutter without first completely repacking it in its original packaging.

Before unpacking the cutter, make sure that there is enough space to assemble the stand and to set the cutter aside to insert the stand screws.

CAUTION**:** For safety reasons, no fewer than two people should be involved in unpacking the cutter.

1.1.1 Removing the packaging from the cutter

1. Remove the straps and the staples and open the lid of the box.
2. The cutter is packed in foil. The models D120, D140 and D160 are delivered with the stand and basket under in the box. The accessories are located at the side in a separate box. Check first whether everything is present.
3. Do not throw away the packaging. Shipping it without the original box voids any warranty.

FIG 1-1
SUMMACUTTER CUTTER FULLY BOXED

1.1.2 Setting up the machine with a stand

1. Verify that the stand and basket come with all the accessories.
The box containing the stand should contain following:

a. 2 legs
b. 2 feet
c. 1 horizontal panel
d. Bag of 4 casters, screws and other accessories to mount the stand

FIG 1-2
CONTENTS OF BOX STAND

2. The box containing the basket should contain following:

a. Total of 7 tubes for [media basket
b. Linen media basket
c. Bag of accessories to mount the basket

FIG 1-3
CONTENTS OF BOX BASKET

3. Mount on each leg a foot. Make sure that, if the legs are orientated the same way, on one leg the long end is pointing in one direction and on the other one in the other direction.

FIG 1-4
MOUNTING HORIZONTAL PANEL

4. Mount the horizontal panel. Make sure that the hollow side is orientated to the same side as the long ends of the feet (this would then be the rear).

FIG 1-5
MOUNTING HORIZONTAL PANEL

5. Turn the stand upside down and mount the 4 casters (put the nut first in the casters, then use the 12mm wrench.

FIG 1-6
MOUNTING THE 4 CASTERS

6. Turn the stand the right way up again and put the machine on the stand and secure with 4 screws.

FIG 1-7
MOUNTING THE CUTTER ON THE STAND

7. Mount the basket. Make sure the long tubes are used at the rear. Put a saddle clip to keep tubes in their place.

FIG 1-8
INSTALLING THE BASKET

1.1.3 Setting up the machine without a stand

The smaller models are equipped with an extra media guide. In order not to damage this part, special attention is requested when putting a machine on a surface. This media guide should always be over an edge.

FIG 1-9
POSITION OF A CUTTER ON A TABLE

1.2 SummaCut Cutter Components

1.2.1 The Cutter as viewed from the front

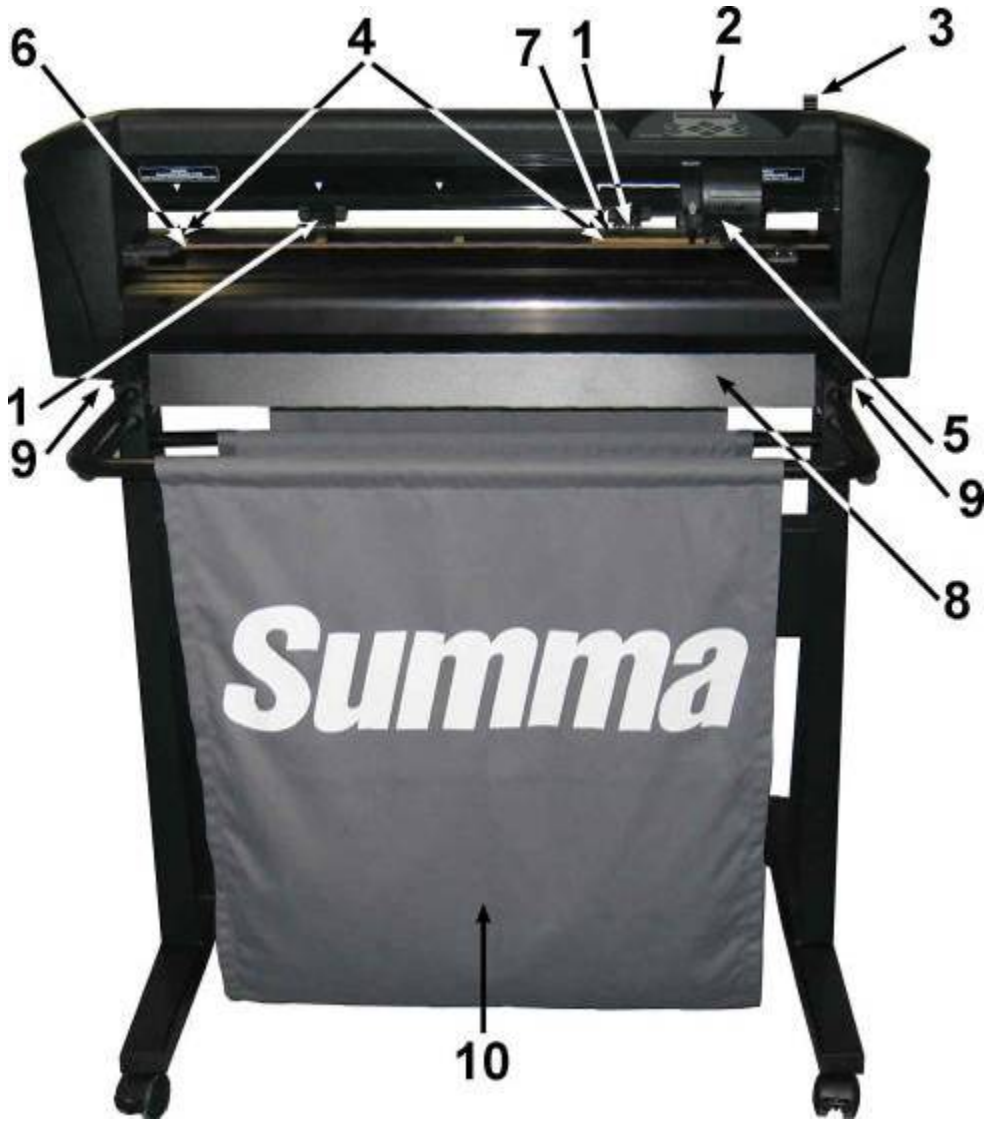


FIG 1-10
SUMMACUT CUTTER, FRONT VIEW

1. **Pinch rollers:** The pinch rollers clamp the media to the drive system to ensure accurate tracking. The D120 has one and the D140 and D160 have two extra pinch rollers to ensure that wide media stays flat in the middle. The extra rollers in the middle can be enabled or disabled.

2. **Keypad:** All cutter activity can be initiated from keypad. The LCD displays information about the cutter's current status and/or actions that need to be taken.

3. **Pinch roller lever:** This lever is used to raise and lower the pinch rollers for media loading.

4. **Media drive sleeves:** The media drive sleeves move the media only when the pinch rollers are in the "down" position. The Larger the model, the more small sleeves.

5. **Tool carriage:** The tool carriage is the mount for the knife holder, pen or pouncing tool. It has also holds the Optical POSitioning sensor (OPOS).

6. **Cutting strip:** A self-healing orange strip helps avoid any damage to the knife tip when no media has been loaded. Since cutting is done on the cutting strip, it is essential that the strip remains intact.

7. **Media sensor:** A media sensor behind the right sleeve is used to detect the end of the loaded media.

8. **Media guide:** Only on smaller models, prevents the media slipping under the cutter when installed on a table.

9. **Screws to secure the cutter base:** Make sure all screws are secured at each side before the cutter is used.

10. **Media basket:** The stand and linen media basket come standard with all D120, D140 and D160 models.

1.2.2 The Cutter as viewed from the back

FIG 1-11
SUMMACUT CUTTER, REAR VIEW

1. **Pinch rollers:** The pinch rollers clamp the media to the drive system to ensure accurate tracking. The D120 has one and the D140 and D160 have two extra pinch rollers to ensure that wide media stays flat in the middle. The extra rollers in the middle can be enabled or disabled.

2. **Pinch roller lever:** This lever is used to raise and lower the pinch rollers for media loading.

3. **The fuse box:** The fuse is located at the right side of the power entry module. Check the specification section to see which fuse is used in the SummaCut cutter.

CAUTION: For continued protection against risk of fire, replace only with the same type and rating of fuse.

4. **Power On/Off switch:** This rocker switch, in the middle of the power entry module, sets the cutter's power to ON or OFF. To switch on the power, press the "I" side of the rocker switch. To switch off the power, press the "O" side of the rocker switch.

5. **AC power cord receptacle**: It is located at the left-hand side of the power entry module. The power-up procedure is explained in detail in Section 1.3. Always use a power cord that was delivered with your cutter.

6. **USB port:** This interface is based on the standards specified in Universal Serial Bus Specifications Revision 1.1. It allows a high-speed bi-directional communication between the host computer and the cutter.

7. **RS-232 port:** This DB-9P connector provides serial bi-directional communication between the cutter and a host computer.

8. **Screws to secure the cutter base:** Screws (2 left and 2 right) hold the cutter base to its stand. All the screws must be properly tightened before using the cutter.

9. **Casters:** The casters on the stand are equipped with locking brakes. Once the cutter has been moved to its new location, press the brakes with your foot to lock the casters.

10. **Media basket:** The stand and linen media basket come as standard equipment with all 120, 140 and 160 SummaCut cutters.

11. **Roll media guide bushes:** The two flange guides serve to keep the media roll in place when media is pulled from the roll.

12. **Media support rollers:** Rotating support rollers for the media roll.

1.3 Connecting the Cutter to the Mains

1.3.1 Grounding ("Earthing")

CAUTION: An insulated ground conductor must be installed as part of the branch circuit that supplies power to the wall outlet to which the cutter is connected. The ground conductor must have the same size, insulation material and thickness as the grounded and ungrounded branch circuit supply conductors, but the insulating seat should be green or green with yellow striping.

The ground conductor described above must be grounded at the electrical distribution board or, if power is supplied by a separate system, at the power supply transformer/motor generator set.

The wall sockets into which the cutter is plugged must be of the grounded type. The grounded conductors serving the wall socket must be properly connected to the ground.

For emergency access, the cutter should be installed near the socket-outlet for easy access.

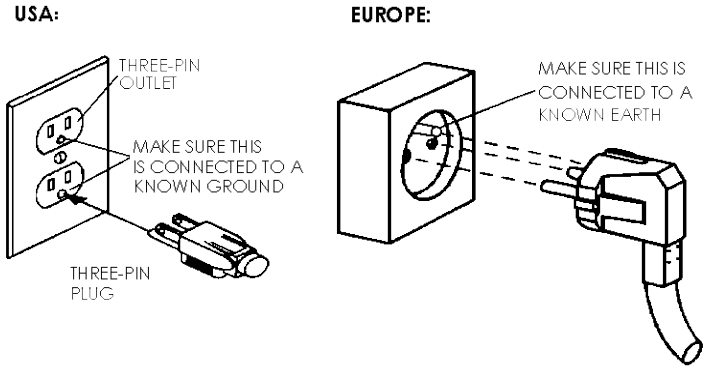

USA:
EUROPE:
THREE-PIN OUTLET
MAKE SURE THIS IS CONNECTED TO A KNOWN GROUND
THREE-PIN PLUG
MAKE SURE THIS IS CONNECTED TO A KNOWN EARTH

FIG 1-12
PROPERLY GROUNDED CONNECTION

1.3.2 Operating voltage

CAUTION: Before changing the fuse, make sure that the cutter is completely disconnected from its power source.

CAUTION: For continued protection against risk of fire, replace only with the same type and rating of fuse.

Fuse Rate: T2.0A, 250V SCHURTER SPT OR EQUIVALENT.

The power supply detects the line voltage and switches automatically between 110V and 230V.

1.3.3 Powering-on the cutter

CAUTION: Be sure the power switch is turned off before connecting the power cord (the "0" side of the ON/OFF rocker switch should be pressed).

WARNING
KEEP FINGERS AND OTHER BODY PARTS AWAY FROM THE CUTTING AREA. THERE ARE HAZARDOUS MOVING PARTS.

1. Plug the female end of the AC power cord into the receptacle located in the power entry module on the cutter's rear panel.
2. Plug male end of the AC power cord into a properly grounded wall socket.
3. Power on the cutter by pressing the "I" side of the ON/OFF rocker switch located on the power entry module on the rear panel.
4. The touch screen will activate and the initialization process will begin. If media is loaded, then the cutter will check size and load the media.

FIG 1-13
MEDIA IS LOADED AND CUTTER IS READY

FIG 1-14
CUTTER IS READY NO MEDIA IS LOADED

1.4 Connecting the Cutter to a Computer

The SummaCut cutters support bi-directional USB and RS-232 connectivity. When both ports are connected at the same time, the port that receives data first will remain active and the other port will be deactivated.

1.4.1 USB connection

The USB cable should be 5 meters (16 feet) or less in length. The connector on the cutter side of the cable should be USB series B 4-pin. The connector on the computer side of the cable should be USB A 4-pin.

.

1.4.1.1 Connecting the SummaCut cutter to a PC using a USB cable

1. Power off the cutter.
2. Insert the S CLASS™ CD into the computer's CD-ROM drive.
3. Let autoplay run autostart (or start by hand).
4. Choose language and install USB driver.
5. Connect one end of the USB cable to a USB port on the computer.
6. Connect the other end of the USB cable to the USB port on the back of the cutter.
7. Power on the cutter (see section 1.3.3) and return to the computer.

   The Found New Hardware Wizard should appear on the computer screen and install the USB driver.
8. Click "OK" and follow the instructions provided by the Wizard.
9. Restart the computer.

NOTE: When connecting a cutter to a computer for the first time using the USB cable, the computer will detect the cutter and install the USB driver if the setup program was run. If the setup program was not run prior to connection, then install the program while cutter is connected and switched on. After that the program is run, the computer will detect a new device and install the correct driver automatically.

NOTE: For connecting more than one cutter to one computer, see section on USB class

NOTE: It is recommended to use always the latest version of the driver. The Cd is made so that it downloads the latest version automatically. If no internet connection is available, then it is possible that the driver on the CD is outdated.

NOTE: When installing a cutter on Windows Vista or Windows 7, then make sure that the user has administrative rights and that UAC is deactivated.

1.4.1.2 Connecting the SummaCut cutter to a Mac using a USB cable

- Mac OS 8.5 to OS 9.2

1. Power off the cutter.
2. Connect one end of the USB cable to a USB port on the computer.
3. Connect the other end of the USB cable to the USB port on the back of the cutter.
4. Power on the cutter (see section 1.3.3) and return to the computer.
5. Insert the SummaCut CD into the computer's CD-ROM drive.
6. Click on the "USB install driver" icon on the CD-ROM.

   This will automatically install the driver and the Summa Port Mapper utility.
7. Remove the CD from the CD-ROM drive.
8. Restart the computer.

NOTE: If the cutter is connected to the computer before device installation, then the computer will regard the cutter as an unknown device. The driver can be installed at any time with or without the cutter connected.

- Mac OSX

Most recent cutting software does not need a driver installation when a computer is connected to the cutter. The software that controls the driver is built into the cutting software.

1.4.2 RS-232 Connection

The RS-232 cable should be 5 meters (16 feet) or less in length. The connectors on both sides are DB-9S type connectors. There is no need to install a device driver when connecting a cutter with an RS-232 connection.
The parameters of the RS-232 connection must be set in either the properties of the COM port in the device manager or in the cutting software program itself. Please refer to the manual for the cutting software on how to set the parameters for the RS-232 connection with the cutter.

Default settings of the RS-232 connection are listed in the table below.

Baud rate	9600
Data Bits	8
Parity	none
Stop Bits	2
Flow Control	Hardware or XON / XOFF

TABLE 1-1
DEFAULT RS-232 SETTINGS OF THE SUMMACUT CUTTER

1.5 Loading Media

The following procedures apply mainly to the use of roll media. If you are using sheets, there are two options:
For long sheets, roll up the sheet so that the alignment is identical to that of a roll.
For short sheets, the alignment is not so important. If the sheet is cut off perpendicularly, it can be aligned to the front border.

1.5.1 Pinch roller positioning

Proper movement of the media will only occur if the media is driven by the two outer pinch rollers that are correctly located over two drive sleeves.

The pinch rollers are lowered or raised simultaneously by means of the pinch roller lever arm located on the right-hand side of the cutter. The pinch rollers must be lifted to allow vinyl loading, during which the media is fed from the rear of the cutter to the front. When raised, the pinch rollers can be moved manually to the left or the right along the pinch roller shaft.

CAUTION: Always make sure that the pinch rollers are fully raised before sliding them to the left or right.
Always hold the assembly at the side of the pinch roller to move it from left to right; do not reposition pinch roller by holding the assembly at the rear of the machine.

The pinch rollers MUST be positioned correctly and lowered onto the media before an automatic load sequence is initiated. Make sure that all the pinch rollers are positioned above a drive sleeve. The outer left pinch roller should be positioned in one of the detents (click position), just under a white triangular label. The outer right pinch roller should be positioned somewhere over the long drive sleeve, click positions are located at the edges of the sleeve (area marked with a white triangular label).

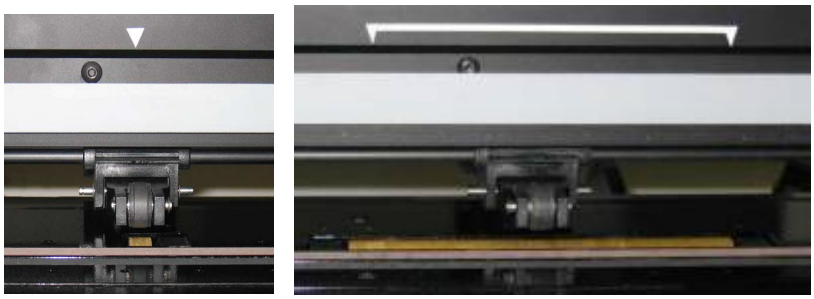


FIG 1-15
POSITION PINCH ROLLERS

ATTENTION: Always leave the pinch rollers in the "up" position when the cutter is not in use. Leaving the pinch rollers in the "down" position for a long time will result in a flat spot in the pinch rollers, which will seriously [negatively] affect tracking performance and cutting quality.

NOTE: When the pinch rollers are raised during a job, then the cutter will immediately stop and after a second move the carriage to the right side.

1.5.2 Loading media

1. Raise the pinch rollers by means of the pinch roller lever arm, which is located on the right-hand side of the cutter, next to the touch panel.

FIG 1-16
PINCH ROLLER LEVER

2. Loosen the knobs on the two media flanges. The following illustration shows a loosened flange (1) and a tightened flange (2).

FIG 1-17
MEDIA FLANGES

3. Insert a loosened flange into one end of the media roll and tighten the knob. Verify that the flange is secure. Then do the same on the other side of the roll.

4. Place the flange-equipped roll on the media supply rollers. Set the flanges inside the groove of the flange guide. The flange guides can be moved laterally on the roller.

FIG 1-18
POSITION MEDIA FLANGE ON CUTTER

NOTE: If the flanges are not used (not recommended – tracking is not guaranteed), then make sure that the roll is caught between the two flange guides.

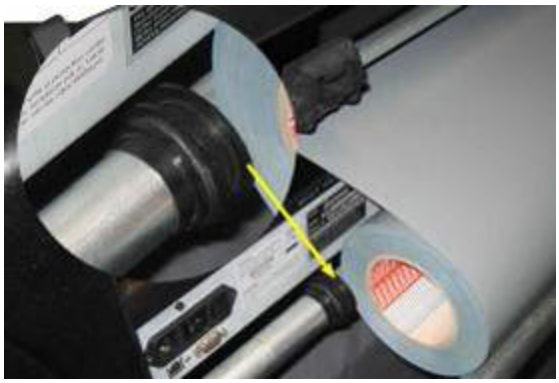


FIG 1-19
FEEDING ROLL MEDIA WITHOUT USING MEDIA FLANGES

5. Start feeding the media from the rear of the machine. Pass the media underneath the pinch rollers towards the front of the machine.

6. Position the left media edge on the left-most drive sleeve and check whether the right media edge is positioned over the long drive sleeve. Then position the left and right pinch rollers.

   The pinch rollers should be positioned over the drive sleeves about 3 to 15 mm (0.1" to 0.6") away from the media's outer edges (1). Then pull on the media while holding the flange at the back so the media is tight.

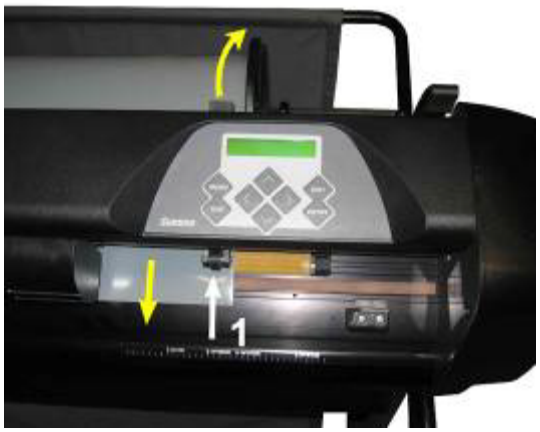


FIG 1-20
MEDIA POSITION

In circumstances where the above procedure does not work, because the media is too narrow to reach the long drive sleeve, try positioning the left media edge over the second left drive sleeve and position the right media edge somewhere over the long drive sleeve. Continue moving the left pinch roller toward the long drive sleeve until both pinch rollers are in their designated position and directly over the edges of the vinyl.

In all cases, both edges of the media must cover a drive sleeve. If this is not the case, reposition the roll of material to cover the drive sleeve.

7. Make sure that the media follows a straight path from the roll of material. To accomplish this, slide the media roll and flange guides from the left to the right along the media support rollers.

WARNING
KEEP FINGERS AND OTHER BODY PARTS AWAY FROM THE CUTTING AREA. THERE ARE HAZARDOUS MOVING PARTS.

8. Lower the pinch roller lever to press the media firmly against the drive sleeves. After one second the tool carriage automatically moves from the right to the left to sense the usable media width.

FIG 1-21
PINCH ROLLER LEVER

NOTE: It is not recommended to unroll the media manually from the roll. The cutter will unroll the media automatically during the load sequence.

9. The positioning and routing of sheet material is identical to that of roll media.

10. The cutter is now ready.

1.5.3 Media load procedure

CAUTION: Do not place any objects in front of, or behind, the cutter that could interfere with cutter operation. Make sure the media is free to move forward and back. Keep hands, hair, clothing and jewelry away from moving parts.

While the cutter is on, it will automatically start executing a minimal loading procedure as soon as the pinch rollers are lowered. The load procedure will also start when the cutter is switched on while media is already in the machine and the pinch rollers are in the "down" position (this is not recommended). Always keep the pinch rollers in the up position while the cutter is not being used.

The minimal loading procedure consists of:

- A media width measurement.
- Media is unwound over a length equal to the width measured between the outer two pinch rollers.
- A simultaneous 45° axial move of the drive drum (sleeves) and cutting head.

After that, the cutter is ready to receive files from the computer.
When receiving a job from the computer, the cutter will automatically pull the required media from the roll. It does this in steps and the length of the vinyl used is equal to a number of times the measured width of the media.

This load procedure is sufficient in most of the cases; however they are some extra load features available.

WARNING
Each keystroke can initiate an internal test or movement of head or media.
Keep fingers and other body parts away from the cutting area.
There are hazardous moving parts.

➢ ***Changing origin.***

1. Press , , and to change the origin.

The media will move to the new origin, values will appear on the LCD. The X value is the distance from the original origin; the Y value is the maximum cutting width.

2. Press to toggle the Y value between the maximum cutting width and distance from original origin. Press to toggle between the maximum cutting length and the distance from original origin.

The X and/or Y value will toggle.

3. Press if the desired origin is reached.

The cutter comes online and is ready to receive data from the computer.

4. Or press to cancel.

The cutter will move to its original origin and come online.

➢ ***Extended load.***

The function extended load makes it possible to define the limits of the Y axis so that the cutter can cut outside the pinch rollers. Media has to be loaded before this function can be used.

1. Press until 'extended load' appears on the LCD.

Extended Load will appear on the LCD.

2. Press .

'Origin' will appear on the LCD.

3. Press or to define the new right limit (origin).

The head will move to its new origin.

4. Press .

'Size' will appear on the LCD.

5. Press or to define the new left limit

6. Press .

Note: Tracking is not guaranteed when using this mode**.**

1.6 Tool Installation

SAFETY WARNING: The SummaCut cutters use razor-sharp knives. To avoid serious injury, use caution when installing, removing or otherwise handling the knife!

1.6.1 Knife installation

A knife has been pre-installed in the cutter.
For safety reasons, the knife depth has been set to zero. Simply turn out the knife (see fig 1-22 yellow arrow clockwise) to start cutting. Below is the complete description of the knife removal and knife installation.

- ***Removing the drag knife***

1. Loosen the head clamp screw (1), swing the clamp arm back and remove the knife holder from the clamp (2).

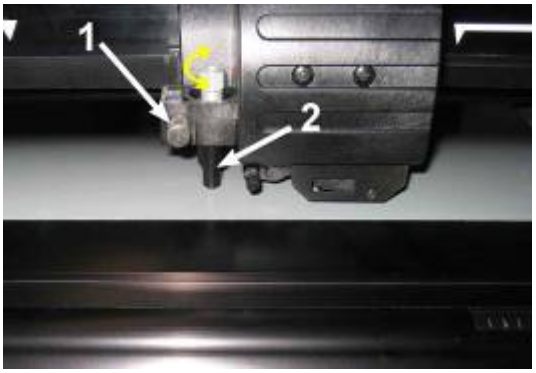


FIG 1-22
REMOVING THE DRAG KNIFE HOLDER FROM THE CLAMP

2. Turn the knurled adjustment knob (3) clockwise to push the knife (4) out of the holder (5).

FIG 1-23
REMOVING THE KNIFE FROM THE STANDARD DRAG KNIFE HOLDER

3. Carefully pull the knife from the holder.

➢ ***Installing the drag knife***

1. Remove the aluminum plunger from the plastic knife holder (5) by turning the knurled adjustment knob (3) counterclockwise until the plunger comes out of the holder.

2. Insert the conical, non-cutting end of the knife into the opening in the narrow end of the holder; gently push the knife all the way in.

3. Turn the holder upside down and tap it lightly on a solid surface to ensure that the knife is completely inserted.

4. Slowly turn the knurled knob clockwise until the tip of the blade extends the distance required for the desired cutting media (t) as shown in figure below.

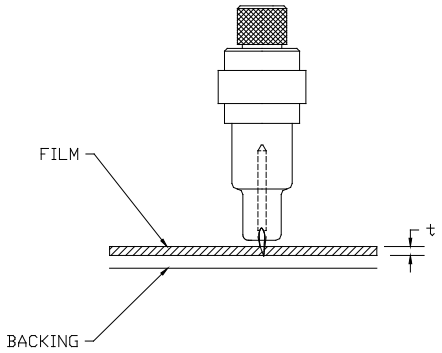


FIG 1-24
KNIFE LENGTH ADJUSTMENT

5. Insert the knife holder into the head clamp and push it all the way down (1).

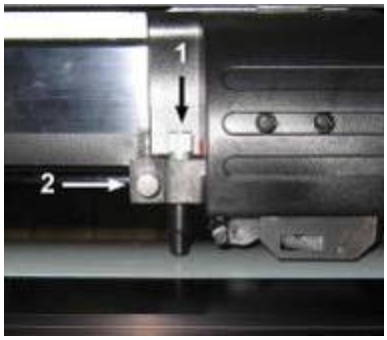


FIG 1-25
DUAL CLAMP DRAG HEAD

6. Tighten the clamp screw (2).

➢ ***Setting knife depth and pressure:***

(Media must be loaded in the cutter before knife pressure can be tested).

> WARNING
> Each keystroke can initiate an internal test or movement of head or media.
> Keep fingers and other body parts away from the cutting area.
> There are hazardous moving parts.

1. Press MENU three times.

Knife Pressure will appear on the LCD.

2. Press ENTER.

Current knife pressure will appear on the LCD.

3. Press < or > to change the knife pressure.

The value will change

1. Press TEST to perform the internal knife pressure test.
2. Press ENTER to confirm the chosen knife pressure.
3. Press EXIT to leave the pressure unchanged.

Once TEST is pressed, the current knife pressure value will be set automatically to the new value and the cutter will cut the knife pressure test pattern.

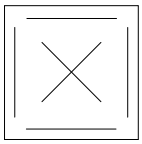


FIG 1-26
KNIFE PRESSURE TEST PATTERN

Peel out the rectangle and inspect the media backing.

The knife depth is set correctly when the test pattern cuts through the vinyl completely, the vinyl is removed, and the blade tip visibly scratched the front side of the media backing. The blade should never cut through the backing; just slightly scratch the silicon coating and first few fibers of the backing material.

Because the knife pressure setting depends on the thickness and type of media to be cut, adjusting knife pressure will require some practice. In general, the knife depth must be increased when using thicker types of vinyl and decreased when using thinner types of vinyl.

4. Press

twice to leave the knife pressure menu.

CAUTION: After setting the cutting depth and/or the knife pressure, perform a thorough visual check of the knife blade, which can be seen protruding from the knife holder, and test cutting results on a scrap of vinyl media.

WARNING: Do not operate the cutter if the knife blade cuts through the media backing, as this will seriously damage the cutter's rubber cutting strip and the knife.

CAUTION: For most vinyl cutting operations, the knife blade tip will be barely visible at the bottom of the knife tool. If the knife blade tip is clearly visible, then the cutting depth must be readjusted.

To prevent damage to the cutter, check the depth of the knife blade tip and the quality of the cut each time you load a different type of vinyl into the cutter.

1.6.2 Pen installation

The SummaCut cutters can also be operated with a plotter-type pen. After replacing the knife with a pen, the cutter can be used as a plotter to draw draft plots of new or existing designs on paper.

1. Loosen the head clamp screw, and then remove the tool from the clamp.
2. Install the pen in the clamp and tighten the clamp screw.
3. The change of tool can either be input on the control panel or with Summa Cutter Control (PC only), or with the cutting software.

Selecting pen operation disables the knife offset correction, and changes the pressure to "pen pressure."

NOTE: The information on the LCD shows the tool currently selected by the cutter. Make sure the cutter's tool setting matches the actual tool in use.

FIG 1-27
KNIFE IS CHOOSEN TOOL

FIG 1-28
PEN IS CHOOSEN TOOL

2 Basic Operation

2.1 LCD AND CONTROL PANEL

The liquid crystal display (LCD) contains one line of 16 characters. The LCD provides cutter status information during operations and displays menu options for the configuration of the cutter.

FIG 2-1
TOUCH SCREEN

The liquid crystal display (LCD) contains one line of 16 characters. The LCD provides cutter status information during operations and displays menu options for the configuration of the cutter.

The various menu and submenu items are always presented in a loop, which means that, when the last menu or submenu item is displayed, pressing the appropriate key will automatically take you back to the first item of the same menu or submenu.

NOTE: A parameter or parameter value preceded with an asterisk (*) is the current selected parameter or parameter value. If a menu is left with a value on the LCD which is not preceded by an asterisk, then this will not be the saved value.

Each keystroke can initiate an internal test or movement of head or media.

WARNING
KEEP FINGERS AND OTHER BODY PARTS AWAY FROM THE CUTTING AREA. THERE ARE HAZARDOUS MOVING PARTS.

2.1.1 Control Panel

2.1.1.1 The menu key

The **MENU** key is used to reach the most common menu items of the cutter quickly. A last menu item in the row gives access to a submenu with which all the other functions of the cutter can be reached (see section 2.3).

2.1.1.2 The exit key

The **EXIT** key (cancel key) cancels the current operation

Pressing this key when the cutter is cutting stops the current job.

2.1.1.3 The enter key

The **ENTER** Key (confirm key) confirms a selected menu or a changed menu item.
As long as this key is not pressed a changed value of a menu item is not saved internally and can will be lost if the menu is left.

2.1.1.4 The test key

If there is a certain test routine in a submenu, then it can be activated to start it.
The test key can also be used to set the cutter offline during a job and check the result with the jogging keys. Press the

key to go online again.

2.1.1.5 The jogging keys , , and

The use of the jogging keys varies according to the operation in progress.

For example, when working with different submenus, the or jogging key is used to select the next or previous submenu.

When in a submenu the values can be changed by pressing or .
When the cutter is normal operation, then by pressing either one of the jogging keys, the origin can be changed.

2.2 How to Set Tool Parameters

The SummaCut cutters can work with a knife, pen or pouncer (optional).
Once a tool has been changed, then the tool parameters must be reset or checked.
All the different tools have one parameter name in common: the pressure.
Each tool has also its specific parameters.
Tool parameters can be changed by either changing them in the current user, or simply by changing user (see section 2.4).

NOTE: The SummaCut cutters will only perform according to specifications if a genuine Summa knife, pen or pouncing tool is installed. Do not replace the standard knife, pen or pouncing tool with products from other manufacturers.

Each keystroke can initiate an internal test or movement of head or media.

WARNING
KEEP FINGERS AND OTHER BODY PARTS AWAY FROM THE CUTTING AREA. THERE ARE HAZARDOUS MOVING PARTS.

2.2.1 Setting tool type

1. Power on the cutter.

2. Press

.

'Velocity' will appear on the LCD.

3. Press .

'System Setup' will appear on the LCD.

4. Press

.

'Confidence' will appear on the LCD.

5. Use or to scroll through the menu until 'Tool' is reached, press

.

Current selected tool will appear on screen.

6. Press or to change the tool.

The tool will change on the LCD.

7. Press

to confirm.

An asterisk will appear before the tool, indicating it is now the selected tool.

8. Press

twice to leave the menu.

2.2.2 Changing tool pressure

1. Power on the cutter, load media, and mount tool (see section 1).

2. Press

.

'Velocity' will appear on the LCD.

3. Use or to scroll through the menu until 'Pressure' is reached, press

.

Current pressure will appear on the LCD.

4. Press or to change the knife pressure.

The value will change

1. Press

to perform the internal knife pressure test (see section 1.6.1).
2. Press

to confirm the chosen knife pressure.
3. Press

to leave the pressure unchanged.

2.2.3 Changing drag knife offset

A very important parameter for a drag knife is the offset. The offset is the distance between the knife center and the knife tip.

NOTE: Knife offset should be set each time the knife is changed and should be checked if the knife shows signs of wear.

Typical knife offset for Summa knives is between 0.41 and 0.45 for standard knives, and between 0.9 and 0.97 for sandblast knives.

NOTE: Sandblast knives should be used when the material that needs to be cut is thicker than 0.25mm.

Changing knife offset:

1. Power on the cutter, load media, and mount tool (see section 1).

2. Press

.

'Velocity' will appear on the LCD.

3. Use or to scroll through the menu until 'knife offset' is reached, press

.

Current offset will appear on the LCD.

4. Press or to change the knife offset.

The value will change

1. Press to perform the internal knife offset test.
2. Press to confirm the chosen knife offset.
3. Press to leave the offset unchanged.

When the knife offset is set correctly, the test pattern looks like this:

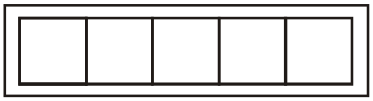
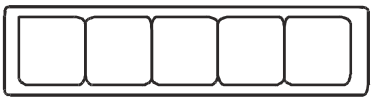
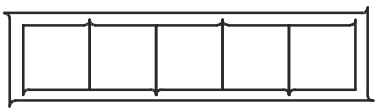


FIG 2-2
CORRECT KNIFE OFFSET PATTERN

When the knife offset is too low, the test pattern looks like this:



When the knife offset is too high, the test pattern looks like this:



2.3 How to Set Cutting Speed

The actual speed at which the tool moves is determined by 4 different parameters. Speed (and acceleration) while the tool is down; speed (and acceleration) while tool is up.
These 4 parameters have been bundled in one parameter to make changing speed fast and easy.
This overall parameter is called "velocity" and is the speed the cutter uses when the tool is down. If velocity is raised or lowered, then the other parameters are also raised or lowered accordingly.

There is one fixed speed: the speed at which the cutter pulls the media from the roll. This speed is fixed at 200mm/s (8ips).

Setting the cutting speed:

1. Power on the cutter.

2. Press

.

'Velocity' will appear on the LCD.

3. Press or to change the velocity.

The velocity will change on the LCD.

4. Press

to confirm.

An asterisk will appear before the velocity, indicating it is now the selected velocity.

5. Press

twice to leave the menu.

Setting the speed parameters separately:

1. Power on the cutter.

2. Press

.

'Velocity' will appear on the LCD.

3. Press
.

'System Setup' will appear on the LCD.

4. Press

.

'Confidence' will appear on the LCD.

5. Use or to scroll through the menu until 'Velocity' is reached, press .

'Velocity' will appear on the LCD.

6. Press or to choose the velocity parameter that needs to be changed.

The menu can scroll between 'UP', 'UP ACC', 'ACC' and current velocity setting.

7. Press or to change the value of the chosen parameter.

The value will change on the LCD.

8. Press to confirm.

An asterisk will appear before the value, indicating it is now the selected setting.

9. Press twice to leave the menu.

NOTE: Velocity is the main speed parameter. The default value for the three other parameters is **AUTO**. This means that they are linked to velocity (which is the speed when the tool is down). These parameters can be set individually, but will then lose the link with the velocity parameter.

2.4 How to Change the User (Quick Parameter Change)

The SummaCut cutters include 4 user configurations, all of which consist of the same parameters. Each configuration can have unique parameter settings. This allows the cutter to be quickly and easily reconfigured for different types of jobs or media.

NOTE: Factory default values for the different users are all set the same.

Changing the User Configuration:

1. Power on the cutter.
2. Press

.

   'Velocity' will appear on the LCD.
3. Use or to scroll through the menu until 'User Config' is reached, then press

.

   'User Config' will appear on the LCD.
4. Press

.

   The current selected user will appear on the LCD.
5. Press or to change the user.

   The value will change on screen, the asterisk will disappear.
6. Press

to confirm.

   An asterisk will appear before the user, indicating it is now the selected one.
7. Press

twice to leave the menu.

2.5 How to Make Sure the Sign Has the Correct Size (Length Calibration)

The SummaCut cutters are friction-feed machines. This means that the cutting length is dependent on the thickness of the material.

The cutters have been calibrated in the factory for standard 2-mil cast or 3-mil calendared vinyl. Each user (the SummaCut has a total of 4) can hold a different calibration factor.
This is very helpful for multi-colored signs; it ensures that the parts in different colors match up, even if different types of vinyl media are used.

NOTE: For standard use, it is not necessary to calibrate the machine. With standard vinyl the accuracy is within 0.2%. However if high accuracy between different vinyl or colors is needed, then calibration is necessary.

Calibrating the media (Length calibration):

1. Power on the cutter, load media, and mount knife (see section 1).

NOTE: The wider and longer the loaded media, the more accurate the calibration will be. Use a piece of vinyl of maximum width and a length that is approximately 1.5 times the width.

2. Press

.

'Velocity' will appear on the LCD.

3. Press
.

'System Setup' will appear on the LCD.

4. Press

.

'Confidence' will appear on the LCD.

5. Use or to scroll through the menu until 'Calibrate X/Y' is reached, press

.

'Calibrate X/Y' *will appear on the LCD.*

6. Press

.

The cutter will reload the media and perform the length calibration test. Take out the media and measure the length of the cut line with a ruler (measuring device). The length that has to be entered is the distance between line 1 and line 2 as shown in the figure.

FIG 2-7
LENGTH CALIBRATION PATTERN

NOTE: The cutter will only be as accurate as the accuracy of the calibration. If the ruler (measuring device) is inaccurate, then re-calibrating may make the cutter's accuracy worse. The accuracy of calibration will be directly reflected in the cuts. Set the cutter to Metric to do the calibration. It is more accurate than the English unit system (see 4.3.20**.**).

7. Use , , and to change the value on the LCD to the measured length of the distance between the two lines down the length of the vinyl roll.

Value will change on the LCD.

8. Press ENTER to confirm.

Value for the Y axis will appear on the LCD.

9. Use , , and to change the value on the LCD to the measured length of the distance between the two lines down the width of the vinyl roll.

10. Press ENTER to confirm.

11. Press EXIT twice to leave the menu.

3 OPOS (Optical POSitioning)

3.1 Introduction

Contour cutting is made possible by the SummaCut highly accurate Optical Positioning System (OPOS).

The OPOS sensor, which is mounted underneath the tool carriage, registers printed squares that are placed around the graphic. Because of this registration process, OPOS can determine the exact position of the printed graphic.

The sensor drops automatically while registering the markers and rises again after completing this task. The improved sensor can read virtually any kind of media-marker combination.

3.2 Basic OPOS operation

Many versions of cutting software have the built-in capability to make contour cutting user-friendly and automatic. Please refer to the user's manual that came with your software or contact your software dealer for specifics.

In general, contour cutting includes the following steps:

- Create a graphic.
- Print the graphic (laminate if necessary).
- Load the graphic into the cutter.
- Set the necessary parameters for the OPOS sensor.
- Load the media and register the markers.
- Cut the graphic.

To ensure that OPOS is working accurately, two calibrations are necessary: the OPOS calibration and the media calibration. The OPOS calibration is the calibration of the distance between the knife tip and the sensor. The media calibration "teaches" the cutter the reflection levels of the marker color and the media color.

NOTE: Although the OPOS sensor has been calibrated in the factory, Summa recommends doing a test to determine how well the factory-set parameters work with the materials you are using. If the accuracy is not what is expected, then do the OPOS calibration. Also refer to the section about detailed OPOS operation (3.3) for extra tips on defining and cutting contours.

3.2.1 OPOS calibration

1. Switch the cutter on and load black vinyl with white backing.

NOTE: Black vinyl with white backing MUST be used when calibrating OPOS. Media calibration setting must be set to default value.

2. Set the head's origin above a clean, blank part of the vinyl.

3. Press

.

'Velocity' will appear on the LCD.

4. Press .

'System Setup' will appear on the LCD.

5. Press

.

'Confidence' will appear on the LCD.

6. Use or to scroll through the menu until 'Cal OPOS' is reached, press

.

The cutter will cut out a square measuring approximately 9.5x9.5mm and move the square forward. "Weed Rectangle" will appear on the display.

7. Carefully weed the square, making sure the edges stay intact. Press

.

OPOS will read the edges of the square and calibrate itself accordingly.

NOTE: In order to keep the accuracy of the OPOS sensor as high as possible, do this calibration each time the knife is been replaced.

3.2.2 Media calibration

Media calibration ensures that the sensor is able to recognize the markers. OPOS is calibrated at the factory to work on a wide range of media. However, certain media -- such as those with a high gloss -- may not work with the default settings. Before working with such materials, perform a media calibration test. This test will alter OPOS's sensitivity so that it will read the markers with greater reliability.

Print a square measuring at least 4x4cm on the media that will be used. Be sure to use the same ink that will be used when creating the registration markers.

NOTE: It is not recommended to do media calibration for OPOS. If the media calibration is done and results are not better, then set the media calibration value again to default: 30 (see further in the procedure how).

Doing media calibration:

1. Turn on the cutter and load the vinyl with the printed square.

2. Press

.

'Velocity' will appear on the LCD.

3. Press
.

'System Setup' will appear on the LCD.

4. Press

.

'Confidence' will appear on the LCD.

5. Use or to scroll through the menu until 'Cal Media' is reached, press

.

'Measure' will appear on the LCD.
The cutter allows the user to choose to either measure the media or to fill in a previously recorded value.

NOTE: If a combination of media color – marker color has already been calibrated and recorded, then press and then

. Now use and to enter this value directly, without having to re-measure it; press

to confirm.

6. Press

.

The cutter will lower the sensor. On the display, the message "put sensor on white area" will appear.

7. Use , and to maneuver the knife on top of a white area (the area should be at least 3 by 3 cm or 1″ by 1″).

8. Press to confirm.

The cutter will make a circular movement while it measures the reflection of the media. It will briefly display the measured values and display the message "put sensor on black area."

9. Use , and to maneuver the knife on top of a black area (approximately in the middle and slightly to the bottom right).

10. Press to confirm.

The cutter will make a circular movement while it measures the reflection of the marker color. It will briefly display the measured values, then it will show a value that is characteristic for this media color – marker color combination. Store this value for future reference.

NOTE: An error message may appear if the sensor is not able to differentiate between black and white. Make sure that the test has been performed correctly. If OPOS is not able to sense the markers, one of the manual alignment methods (see 4.3.28.) must be used.

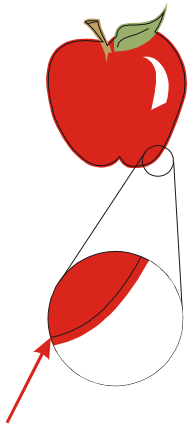
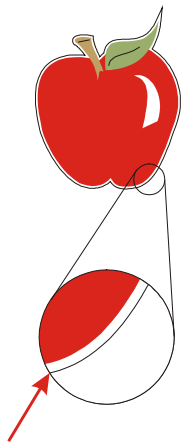
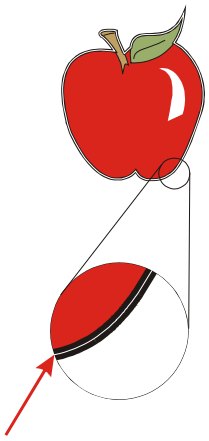
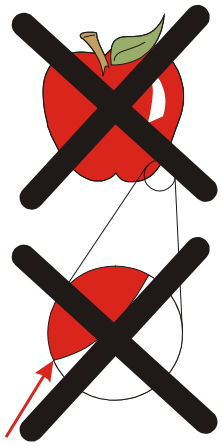
3.3 Detailed OPOS Operation

3.3.1 Creating the graphic with the markers

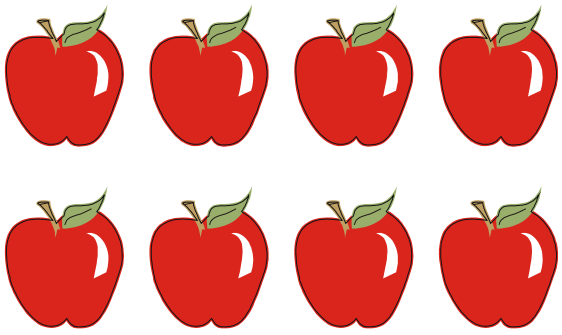
1. Create the graphic and contour cut line(s). For easier handling, place the contour line(s) on a different layer.

> **NOTE:** Do not place contour lines along the edges of graphics or the slightest movement in the media may result in an unsatisfactory cut. Instead, practice one of the following techniques:

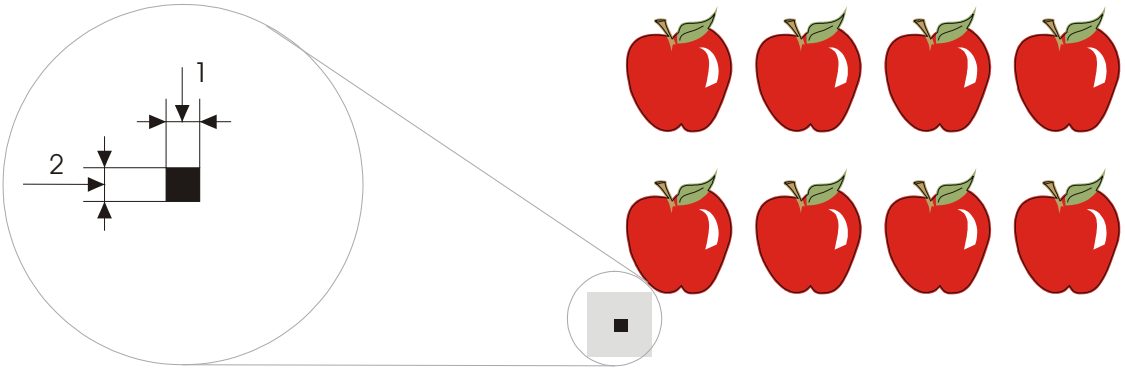
- Place contour lines just inside the graphics (recommended) (1).
- Place contour lines outside the graphics (2).
- Create thick borders around graphics and place contour lines inside these borders (3).

(1) contour line inside graphic recommended	(2) contour line outside graphic	(3) contour line inside a thick border	Contour line on edge of graphic
			

2. If necessary, make additional copies of both the graphic and its associated contour.



3. Insert a marker to represent the Origin. The marker must be a black square. Each of the marker's four sides should measure 2mm but must not be less than 1.5mm or more than 10mm. (1=X-size 2=Y-size.)

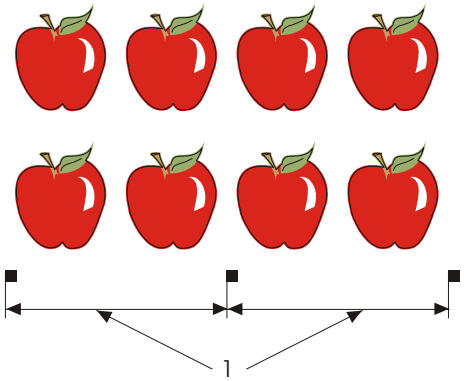


4. Set the line style of the marker to **None**. Line styles of varying thickness can alter the size of the markers. Make sure there is a white margin of about 3 to 4 times the marker size around the marker (in the above picture this area is represented by a gray area). If anything is printed within this margin, the sensor may be unable to locate the marker.

5. Make sure that the Origin marker is situated below and to the left of all contours to be cut.

6. Insert horizontally aligned copies of the Origin marker at regular intervals (X-Distance). Together, these markers indicate the X-Axis.

The X-Distance (1) is the distance from the lower left corner of one marker to the lower left corner of the next marker and depends on several factors. *The X-Distance must be known when setting the OPOS parameters manually*.



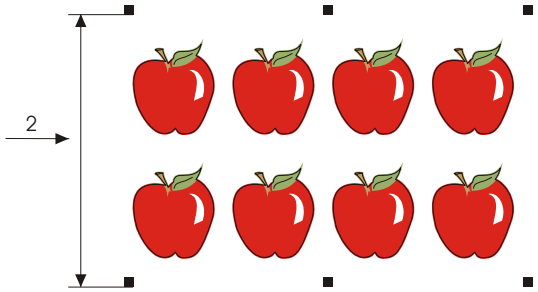
NOTE: OPOS will operate faster as the X-Distance increases. Conversely, OPOS will operate more accurately as the X-Distance decreases; however, the impact on accuracy is minimal. Recommended distance between the markers is 400mm. Maximum X-Distance is 1300mm.

7. Make sure there is enough white space around each marker. The X-Distance should be decreased if the margin of white space around the marker is not 3 to 4 times larger than the marker itself.

8. Make sure that the markers are perfectly level with one another.

9. Make a copy of the row of markers created in step 5. Place this new row above the graphic to indicate the Y-Axis.

The Y-Distance (2) is the distance from the bottom of one marker to the bottom of the next marker along the Y-Axis. *The Y-Distance must be known when setting the OPOS parameters manually.*



10. Make sure the two rows of markers have not shifted along the X or Y Axes.

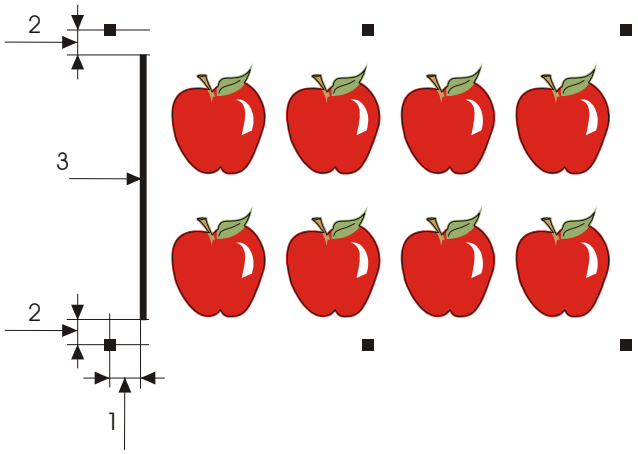
11. Check to be sure that graphics, markers and contour are each in a separate layer. Copy the origin marker for origin reference in the layer of the contours.

NOTE: The layer with the graphic and the layer with the markers must be printed out. The layer with the contour lines and the origin reference must be cut out.

NOTE: The optimum marker size depends on the type of printer and the X and Y distance of the markers.
Inkjet printers with a lot of bleed require slightly larger markers. Some tests will be needed with the printer in question to decide on the right marker size.
If the X distance is relatively large (> 800mm), then slightly larger markers could be used.

3.3.2 OPOS XY

There exists a function in OPOS to compensate for curved printing errors in the Y axis also. This is called OPOS XY. An extra line needs to be printed with the design to be able to use the OPOS XY functionality.



The line may be added between or above the front Y markers. The distance between the center of the markers and the line should not be more than 20mm (distance 1). The left and right margin between line and marker should be 10mm for optimal sensing (distance 2). The line itself should be 1mm thick. It is not necessary to have a white area between the extra line and the rest of the design.

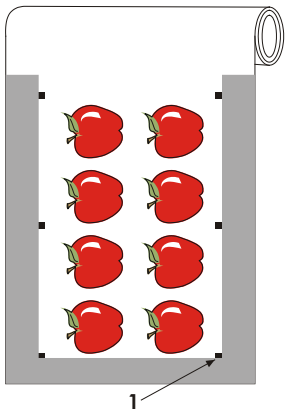
When OPOS XY is enabled, then the OPOS sensor will measure points along the extra line. The number of measuring points will be calculated by the cutter and will depend on the width of the design.

NOTE: The default setting for OPOS is OPOS. If the OPOS XY functionality is needed, then the user must set change the setting 'alignment mode' in the OPOS Setup to OPOS XY by hand on the control panel (see section 4.3.15) or via the cutting software.

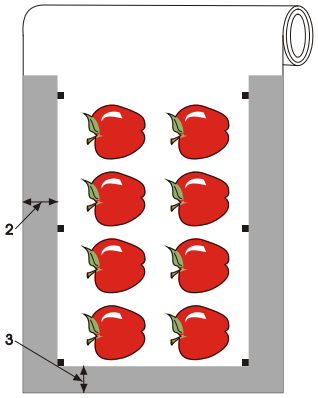
NOTE: Some cutting software do not support the OPOS XY feature. If they also send the alignment command 'OPOS' to the cutter, then they block the OPOS XY feature of the cutter. If it is possible to define a line by hand in the design so that it meets up to the specifications above, then the blocking of the software can be neutralized by using the setting: 'FORCE OPOS XY' in the alignment mode.

3.3.3 Printing the graphic

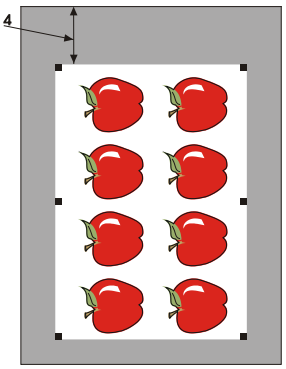
1. Print the graphic and its markers with a printer (scale = 100%). When printing on a roll, make sure that the graphic's Origin marker coincides with the media's origin (1).



2. Make sure there is *at least* a 1cm (0.4in) margin on each side of the graphic (2). A 2cm (0.8in) margin is preferable. There must also be a front margin of 1 cm (3).



3. Leave a margin of at least 4cm (1.6in) following the print when using sheets or when cutting the print off a roll (4).



3.3.4 Loading the graphic into the cutter

Load the printout into the cutter as described in section 1.5. Make sure that the marker indicating the Origin is situated at the bottom right corner of the cutter.

3.3.5 Setting the parameters for the OPOS sensor

The OPOS parameters are variables that define the distance, size, and number of markers. Most cutting software sets these parameters automatically and even starts the special load procedure.

	Range
X distance	30 mm to 1300 mm
Y distance	30 mm to 1600 mm
X size	1.2 mm to 10 mm
Y size	1.2 mm to 10 mm
Marker Count on one line	2 to 64

Changing OPOS setting manually:

1. Power on the cutter.

2. Press

.

'Velocity' will appear on the LCD.

3. Press
.

'System Setup' will appear on the LCD.

4. Press

.

'Confidence' will appear on the LCD.

5. Use or to scroll through the menu until 'OPOS Settings' is reached, press

.

'X Distance' will appear on the LCD.

6. Press or to choose the parameter that needs to be changed (checked).

The menu can scroll between 'X Distance', 'Y distance', 'X size', 'Y Size', 'Marker count and 'Sheet Mode' (see section 3.4.2).

7. Press

to confirm.

The value of the chosen parameter will appear on the LCD.

8. Press or to change the value of the chosen parameter.

The value will change on the LCD.

9. Press

to confirm.

An asterisk will appear before the value, indicating it is now the selected setting.

10. Press

twice to leave the menu, or once to choose and go to 6.

3.3.6 Registering the markers

Most cutting software will initiate the special load procedure after the parameters are sent. If the software does not do this, then initiate the loading sequence from the cutter's touch panel.

Registering the markers:

1. Power on the cutter and load the media.

2. Press

.

'Velocity' will appear on the LCD.

3. Use or to scroll through the menu until 'Align Load' is reached, then press

.

A message prompting the user to set the knife above the first marker will scroll across the LCD.

4. Use , , and to do so and press

.

The cutter will reload the media to check if the loaded length matches with the OPOS parameters used. Then it will return and read the markers.

NOTE: If a marker cannot be read, then the user will be given the option to re-position the knife (sensor) or to abort.

NOTE: If an error occurs or the cutter cannot read the markers after three attempts, the following message will be displayed: "Markers could not be sensed, press

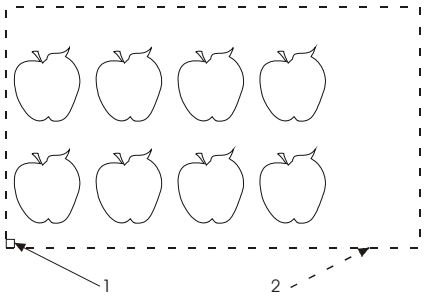
to continue."

3.3.7 Cutting the contour

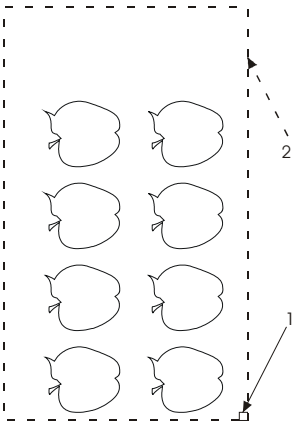
1. Make the layer containing the contour lines visible and printable. Do the opposite with the print data.

2. Make sure that the origin marker is also defined as a contour. This will be used as the origin for the cutting.

3. Once you are using the cutting software, it may be necessary to collectively rotate the contours and markers so that the Origin marker (1) is situated in the bottom left corner of the cutting area (2) as viewed on the screen. If your cutting software's default orientation is not set to "landscape," the contours and markers will need to be rotated.



Orientation needed in most cutter software.



Orientation when using WinPlot

4. Make sure that the cutter is connected to the computer and that the cutter is switched on. The cutter's touch screen should indicate that the cutter is ONLINE.

5. Click **Cut** from within the cutting software. The cutter should begin cutting the contour and return to ONLINE status when finished.

3.4 Automating Tasks with OPOS

In normal OPOS jobs, the user needs to only to set the tool above the first mark to start the job. OPOS allows the user to automate certain tasks, thus reducing user intervention and production time. There are several type of automation.

Automatic start of the OPOS job
This is controlled by the parameter OPOS origin. A combination of this parameter setting and/or special origin setting during loading of the media can make that the user doesn't have to set the tool above the first mark to start an OPOS job.

Multiple copies of the same job
When cutting multiple graphics, the user only needs to maneuver the OPOS sensor above the Origin mark of the first graphic; cutting subsequent graphics does not require additional user input.

There are two multiple-job situations in which OPOS can be used:

a. When cutting multiple (copies of a) graphic(s) on the same media roll.
b. When cutting the same graphic on multiple media sheets.

Most automated tasks are organized from within the cutting software. However, when the same graphic contour needs to be cut out, then the automatic tasks may also involve some manual manipulation.

Before using the automating features, note the amount of your cutter's RAM. If the cutter's RAM is *greater* than the job's file size, then the automating features may be used. If the cutter's RAM is *less* than the job's file size, then the automating features may not be used.

Unattended contour cutting (roll to roll)

A special barcode can be printed together with the job. This barcode can then be used to access the correct cutting data so the cutter can cut one job after another without user intervention.

3.4.1 OPOS origin

The parameter OPOS origin is created to automate the start of the OPOS procedure. This parameter has 4 settings. The usage of this parameter is dependent of the chosen OPOS mode.
This parameter can be found in the system sub menu OPOS parameters (see section 4.3.28)
If the OPOS is OPOS barcode or OPOS Sheet, then this parameter has no effect.
The useful combinations are in the table below.

	OPOS X	OPOS XY
Mark	**'Indicate Mark'**	**'Indicate Mark'**
XY-correction line	-	**'Indicate Line'**
Current Position	**'Current Position'**	**'Current Position'**
Center of Media	-	**'Center of media'**

3.4.1.1 In combination with OPOS X mode

OPOS Origin is set to 'Mark'.

This is the default setting. Upon receiving an OPOS job from the computer, the cutter will prompt the user to set the tool above the first mark and press Apply. The cutter will then start searching for the OPOS mark around that position.

OPOS Origin is set to 'Current position'.

Upon receiving an OPOS job from the computer, the cutter will immediately start looking for the mark when it gets an OPOS job from the computer without waiting for the user to move the tool. Therefore, the user will have to set the tool above the first mark while loading the material.

If OPOS origin is set to either 'XY-correction line' or 'Center of media', then the cutter will react as if the parameter was set to 'indicate mark'

3.4.1.2 In combination with OPOS XY mode

OPOS Origin is set to 'Mark'.

This is the default setting. Upon receiving an OPOS job from the computer, the cutter will prompt the user to set the tool above the first mark and press Apply. The cutter will then start searching for the OPOS mark around that position.

OPOS origin is set to 'Indicate line'

Upon receiving an OPOS job from the computer, the cutter will prompt the user to set the tool under the OPOS XY line and press Apply. The cutter will then start searching for the OPOS XY line by moving the media slowly forward. Once it has found it, it will follow this line to the right until it finds the first mark and then start searching for the first mark.

OPOS origin is set to 'Current Position'

Upon receiving an OPOS job from the computer, the cutter will immediately start searching for the OPOS XY line by moving the media slowly forward. Once it has found it, it will follow this line to the right until it finds the first mark and then start searching for the first mark. Therefore, the user will have to set the origin under the OPOS XY line immediately after that the media has been loaded.
This setting has been created for jobs are left aligned and differ a lot in size on the roll. The origin/tool can then be set to the left of the media under the OPOS XY line so that the origin mark can be found, even it is far away from the right side of the media.

OPOS origin is set to 'Centre of media'

Upon receiving an OPOS job from the computer, the cutter first set the OPOS sensor in the middle of the media. Then it will start searching for the OPOS XY line by moving the media slowly forward. Once it has found the XY line, it will follow it to the right until it finds the first mark and then start searching for the first mark.
This setting has been created for jobs on a roll where the width of each job is at least half the width of the media (this is usually the case; otherwise there is a lot of wasted media). This method is slightly slower than the previous method.

3.4.2 Cutting multiple copies of a graphic on the same roll

If the same graphic design has been printed on a roll with equal distance between the different graphics, then this feature can be used.

This way of automating is very software dependable. Usually are necessary parameters need to be set in the software itself. In rare cases, the distance between jobs needs to be set in the cutter itself. The only possible way to do this is to use Summa Cutter Control

3.4.3 Cutting the same graphic on multiple media sheets

If the same graphic design has been printed on a multiple sheets, then this feature can be used.

> **NOTE:** The sheets should be more or less the same size, and the graphics on them should be oriented and positioned the same way.

First, load the media and check that the parameters of the OPOS markers are set correctly.

Cutting the same graphic on multiple media sheets:

1. Power on the cutter.

2. Press

.

'Velocity' will appear on the LCD.

3. Press .

'System Setup' will appear on the LCD.

4. Press

.

'Confidence' will appear on the LCD.

5. Use or to scroll through the menu until 'OPOS Settings' is reached, press

.

'X Distance' will appear on the LCD.

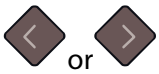
6. Press or until 'Sheet Mode' appears on the LCD.

'Sheet mode' is visible on screen.

7. Press

to confirm.

The value of the chosen parameter will appear on the LCD.

8. Press  to change the value to 'ON'.

'ON' will appear on the LCD.

9. Press to confirm.

An asterisk will appear before ON, indicating it is now the selected setting.

10. Press twice to leave the menu.

11. Register the markers and cut the first contour as described in sections 3.3.5 and 3.3.6.

The cutter will stop after the first contour has been cut and come online again.

12. Raise the pinch rollers and manually remove the sheet.

13. Insert the next sheet into the cutter. Lower the pinch rollers.

NOTE: The second and any following sheets must be loaded in the cutter at the same position as and with the same orientation of the first sheet. When in OPOS sheet mode, the cutter stores the distance between edges of the sheet and the first OPOS marker.

TIP: Use easy orientation points to be able to quickly position the sheet. In the figure below, a rim of the base plate and the side of the pinch roller assembly are used to align the sheets.

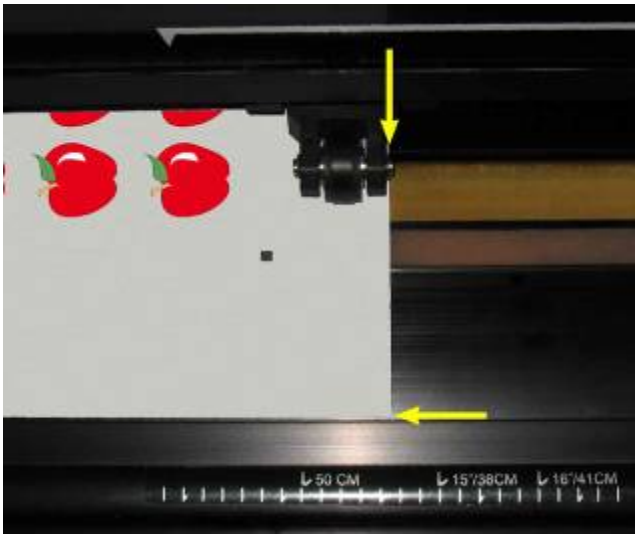


FIG 3-1
POSITION MEDIA FRO MULTIPLE SHEET

3.4.4 OPOS Barcode

The SummaCut cutters can also read a barcode. Certain RIP's have the ability to print a barcode together with the OPOS markers. This barcode can then be used to identify the job and retrieve the needed cut data automatically from the computer.
The complete procedure is normally started from the computer. The cutting software will usually have a button or a command called 'scan a bar code'. First make sure that the media is loaded.

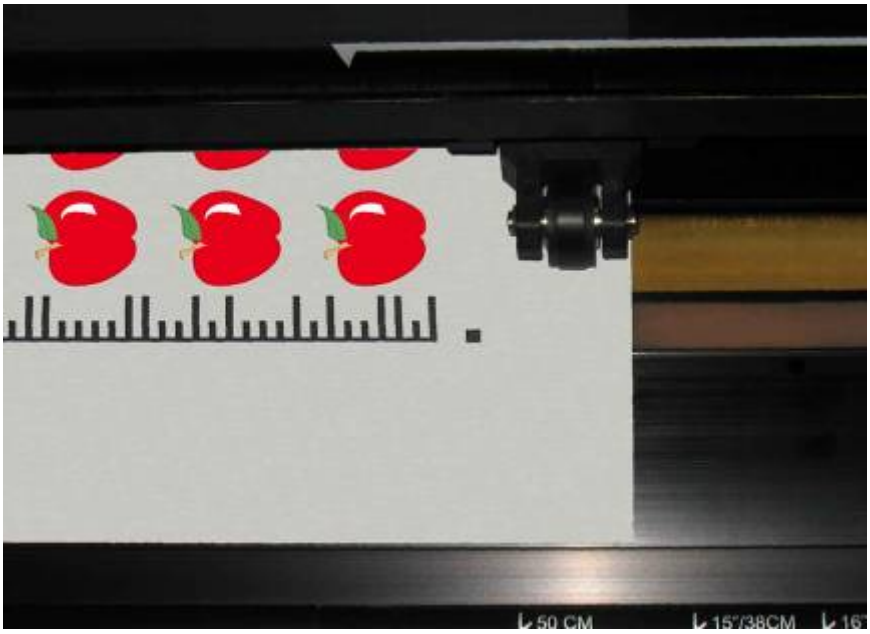


FIG 3-2
OPOS BARCODE JOB LOADED

Start the procedure from the computer or start from the touch screen.
To start from touch screen:

1. Power on the cutter.

2. Press

.

'Velocity' will appear on the LCD.

3. Press .

'System Setup' will appear on the LCD.

4. Press

.

'Confidence' will appear on the LCD.

5. Use or to scroll through the menu until 'Align Mode' is reached, press

.

The current align mode will appear on the LCD.

6. Press or to change the value to 'OPOS Barcode'.

'OPOS Barcode' stays on the LCD.

7. Press

to confirm.

An asterisk will appear before 'OPOS Barcode', indicating it is now the selected setting.

8. Now load as described in section 3.3.6.

The cutter will read the barcode and send this data to the computer.
The cutting software will then automatically send the correct cutting data to the cutter.
The cutter will start sensing the OPOS markers and cut out the job.
After that the OPOS sensor will search if there is a job printed after the one that is just finished and continue to contour-cut.
This will repeated until the all contour-cut jobs on the loaded roll are cut out.

3.5 Cutting through

The cutting through functionality is focussed to cut simple shapes (e.g. rectangles). It is most used in combination with contour cutting.
An interrupted cutting line makes sure that the material remains together thanks to the small media 'bridges'. When the job is finished the cut pieces can be torn out.

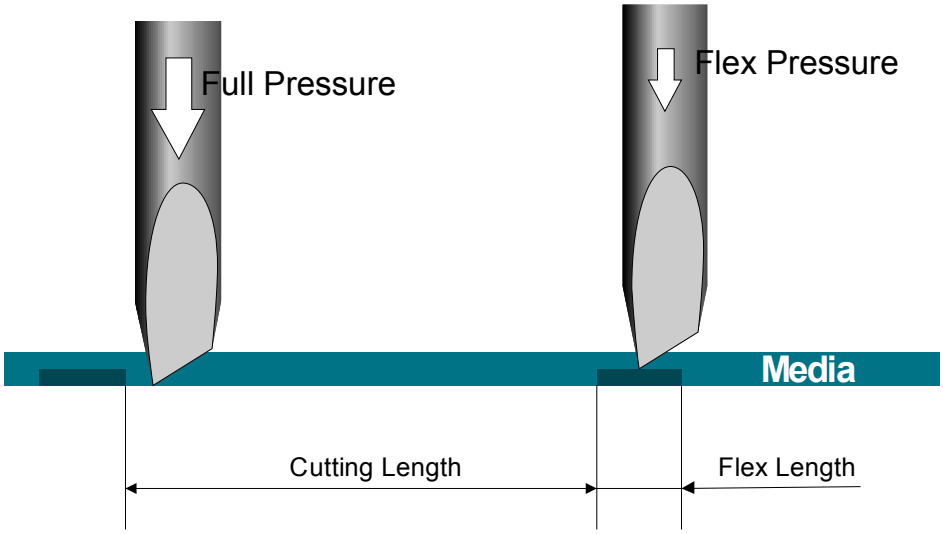


FIG 3-3
FLEXCUT PRINCIPLE

Some cutting software can recognize the difference between a contour line and a cut-through line. The software sends then first the data of the contour lines to the cutter, and then it activates FlexCut, panelling mode and vector sorting and sends the data for cutting through to the cutter.
If the cutting software cannot do this, then the user needs to first send the data of the contour lines separate, set the cutter manually in FlexCut mode and then send the data for cutting through.

Setting the parameters for cutting through the media:

1. Power on the cutter.

2. Press

.

'Velocity' will appear on the LCD.

3. Press
.

'System Setup' will appear on the LCD.

4. Press

.

'Confidence' will appear on the LCD.

5. Use or to scroll through the menu until 'Flex-Cut' is reached, press

.

'Flex-Cut' will appear on the LCD.

6. Press or to choose the Flex-Cut parameter that needs to be changed.

The menu can scroll through from flex-cut mode, velocity, full pressure, full pressure cut-length, flex pressure and flex pressure cut-length.

7. Press or to change the value of the chosen parameter.

The value will change on the LCD.

8. Press to confirm.

An asterisk will appear before the value, indicating it is now the selected setting.

Note: Flex-Cut does not have to be set 'ON' if the cutting software can distinguish the difference between contour cut lines and flex-cut cut lines.

Note: It is difficult to give recommended settings for Flex-Cut. Usually following start values are used: *Flex-Cut mode*: Accurate; *Full Pressure*: 160gr; *Full pressure cut length*: 10mm; *Flex pressure:* 80gr; *Flex pressure cut length*: 0.8mm.

9. can be pressed at any time during the settings of the parameters to check the result.

The cutter will cut out a pattern to check if the settings are usable.

10. Check if the result is the satisfactory. If not change one of the parameters above. Reducing the velocity can also improve the result. It is never recommended to use cutting speeds larger then 400mm/s (16 ips) with cutting pressures above 170 gr.

Note: It is not always easy to find the correct balance between cutting deep enough making sure the pieces can be taken out easily, and not cutting too deep making sure the material keeps it strength while cutting. Sometimes this balance doesn't exist meaning that this material can't be cut through with satisfactory result.

Note: FlexCut parameters are always metric, regardless the value of the menu Units parameter (see section on 4.3.20)

Note: When cutting through, it is recommended that parallel lines are at least 1 cm away from each other. Otherwise, while cutting the second line, the first line may come loose and cause trouble.

11. Press to confirm.

12. Press to leave the menu Flex-Cut menu.

'Flex Cut' will appear on the LCD.

13. Use or to scroll through the menu until 'Panels' is reached, press .

'ON' or 'OFF' will appear on the LCD, depending on whether paneling is already on or not..

14. Press or to choose the Panel-parameter that needs to be changed.

The menu can scroll through from on or off, panels size, recut and sorting.

15. Press or to change the value of the chosen parameter.

The value will change on the LCD.

16. Press to confirm.

An asterisk will appear before the value, indicating it is now the selected setting.

Note: Recommended settings are: *Panels*: ON; *Panel size*: 3-10cm; *recut*: OFF *sorting:* ON.

17. Press twice.

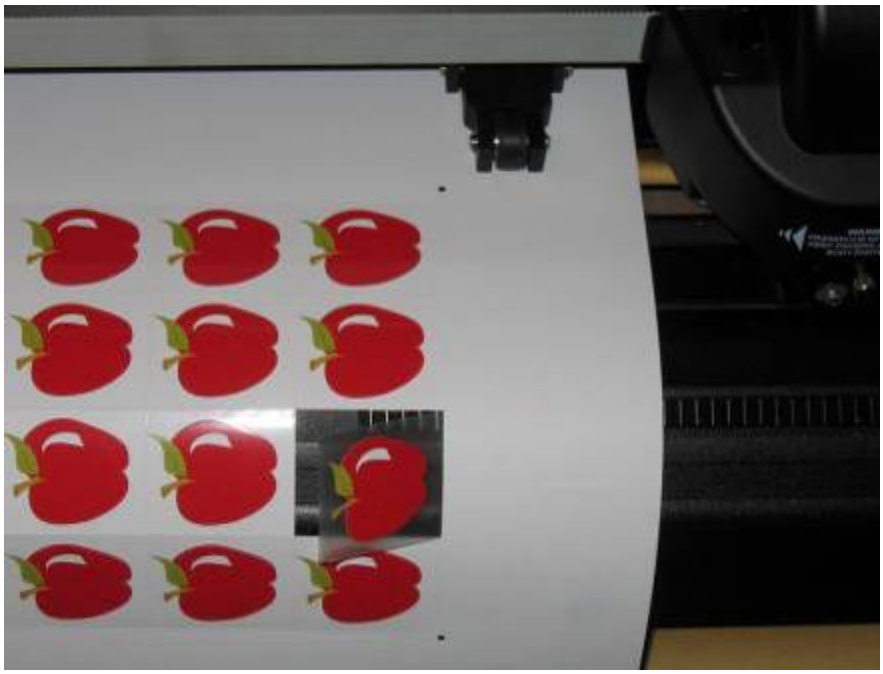


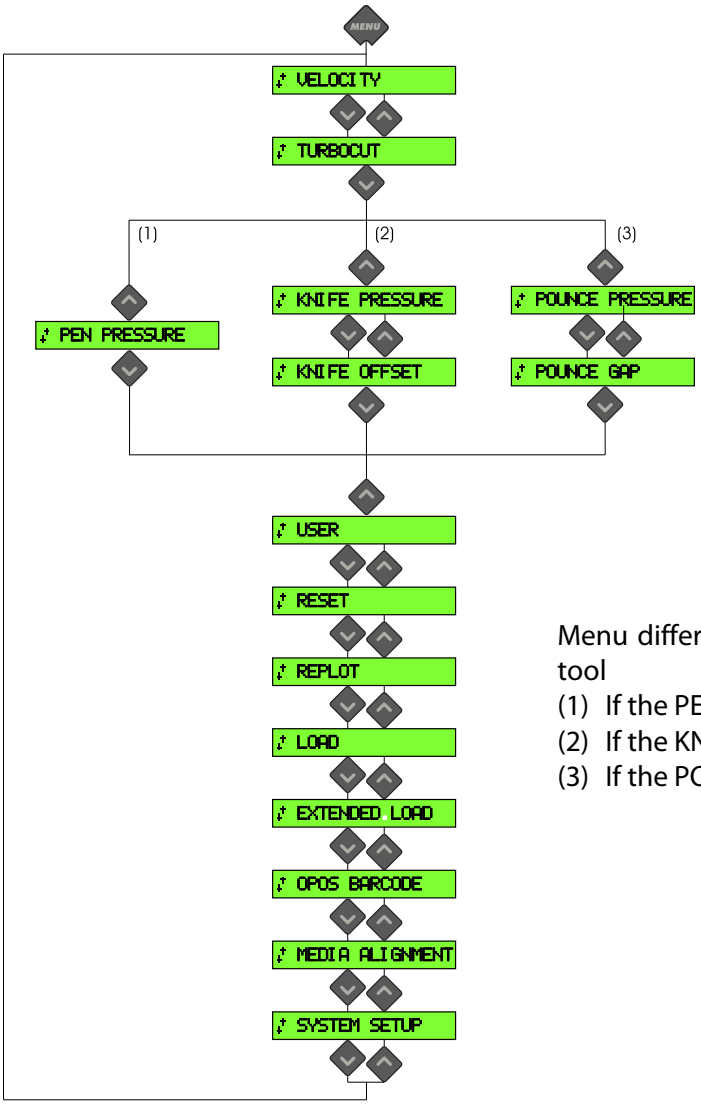
FIG 3-4
COMBINED CONTOUR CUT AND CUTTING THROUGH

4 Detailed Operation

4.1 Introduction

This section is a detailed list of all parameters that can be changed and tests that can be initiated from the control panel.
Section 1 and 2 of this manual describe in detail the most commonly used touch screen manipulation.
This section may be used as a reference for locating a certain parameter setting or test. The less frequently used parameters are also explained in this section.
There are two menus, the main menu and the system setup menu.

4.2 Main Menu



Menu differs according to the selected tool
(1) If the PEN is the default tool
(2) If the KNIFE is the default tool
(3) If the POUNCER is the default tool

FIG 4-1
MAIN MENU

4.2.1 Velocity

Velocity is the bundled parameter to change the speed of the tool/media. This parameter is explained in section 2.3

4.2.2 TurboCut

TurboCut increases throughput without raising the overall speed of the plotter by speeding up the drag movement. The cutting time reduction is significant, especially when cutting small, detailed designs. However, some thicker materials might not cut well with this feature turned ON.

Press the button, then use or to activate or deactivate TurboCut.

Press to confirm or to cancel.
TurboCut is default activated.

4.2.3 Pressure

Pressure is preceded by its tool name. This parameter is explained in section 2.2.2

4.2.4 Knife offset

This parameter is explained in section 2.2.3

4.2.5 Pouncing Gap

The pouncing gap submenu is used to set or modify the distance between the pounced holes. The default pouncing gap value is 1 mm.

After pressing the key, press the or jogging key until the desired pouncing gap is displayed on the LCD and press to confirm.
The value can be set between 1 mm and 50 mm.

4.2.6 User Config.

The SummaCut cutters include 4 user configurations, all of which consist of the same parameters. Each configuration can have unique parameter settings. This allows the cutter to be quickly and easily reconfigured for different types of jobs or media. This parameter is explained in section 2.4

4.2.7 Reset

The RESET instruction performs a complete reset of the cutter. Press the key to execute a reset.

4.2.8 Replot

The RECUT instruction recuts the last file sent to the cutter (provided that it fitted into the buffer). Press the

key to execute the instruction.

4.2.9 Load

This menu can be used when loading sheet material. During the loading, the maximum material length can be set.

4.2.10 Extended Load

This parameter is explained in section 1

4.2.11 OPOS Barcode

Click on this to start the barcode workflow (see section **Error! Reference source not found.**).

4.2.12 Media alignment

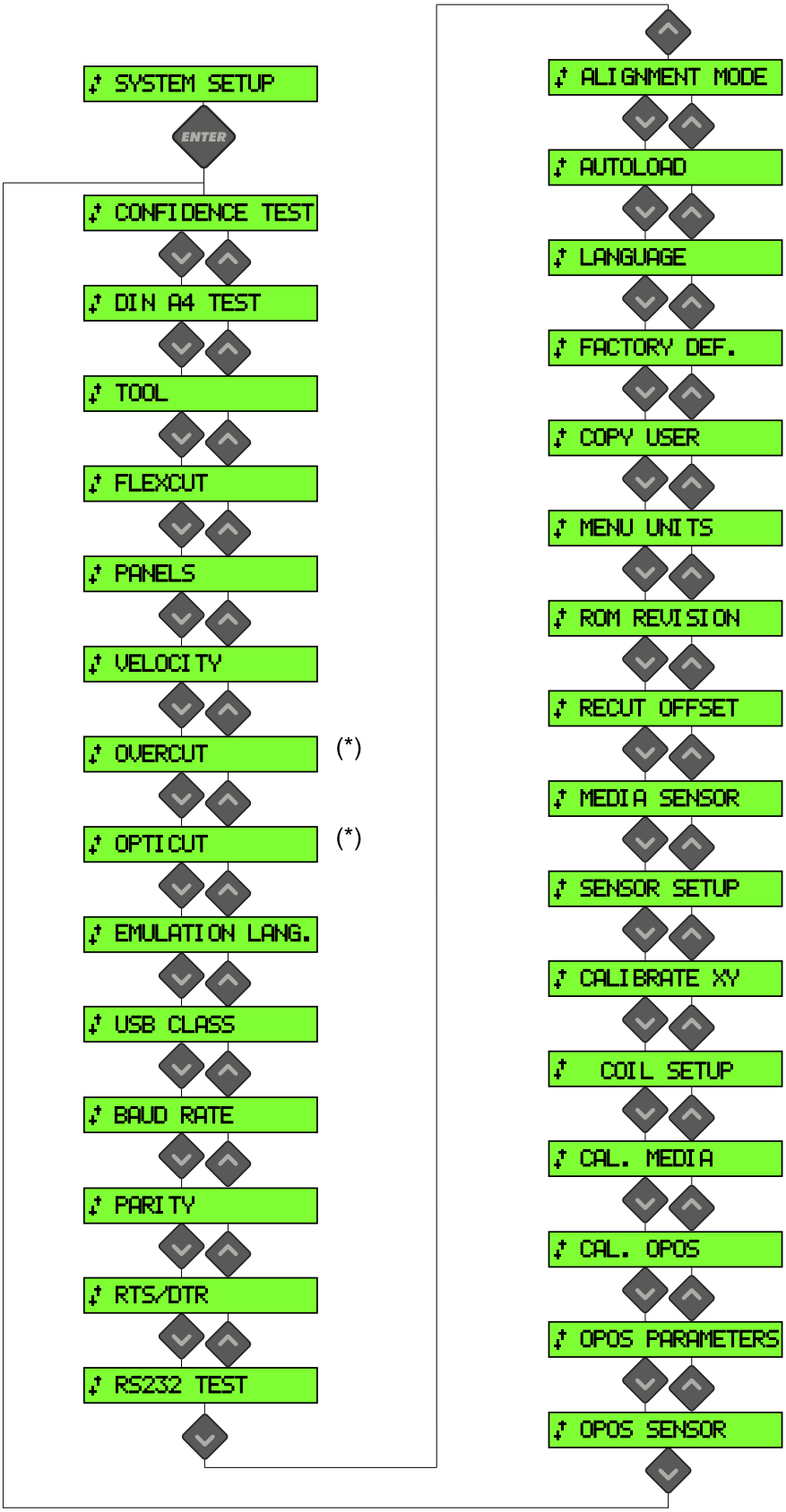
Align load is a special loading procedure to register markers so that pre-printed jobs can be contour-cut. The parameter is explained in section 3.3.6

4.2.13 System Setup

Press

to access the rest of the parameters and internal tests.

4.3 System Setup Menu



(*) only available when the tool is set to drag knife

FIG 4-2
CONFIGURATION MENU

4.3.1 Confidence test

The confidence test performs a quick electrical and mechanical test of the cutter to make sure that the cutter is fully operational. A media sheet of at least A3/B-size should be used for this plot. This test is always cut at the left side of the loaded media. Press

to start the test.

4.3.2 DIN A4 Test

The DIN A4 Test also performs an electrical and mechanical test of the cutter, in order to check the cut quality, but also provides the user with feedback on knife setting, knife pressure, knife offset, and cutting depth.

This cut is always run as a DIN A4 portrait/A-size image, regardless of the actual size of the media loaded. If the media loaded is smaller than DIN A4/A-size, part of the outer box will be clipped (not cut). Press

to start the test.

4.3.3 Tool

Changing of tools is explained in section 2.2.1

4.3.4 FlexCut Mode

FlexCut can be set to OFF, Fast, or Accurate. When the cutter is set to Fast or Accurate, it will alternately cut a certain length with full pressure, and a certain length with reduced pressure. The advantage of the FlexCut feature is that it cuts completely through the material, yet allows the material to stay together by means of the small media bridges.

Fast is the quickest mode, but it is less precise due to the pressure changes during the cutting.
Accurate is much slower, but much more precise, as the cutter stops at every change of pressure.

There are 5 typical FlexCut parameters:

1. *Full pressure:* This parameter determines full pressure used during FlexCut mode.
2. *Full pressure cut length:* This parameter determines the length that is cut with full pressure, usually the length that will be cut all the way through.
3. *Flex pressure cut length*: This parameter determines the length that will be cut with reduced pressure or without pressure. This is usually a much smaller value than the full pressure cut length – this is the length of the media bridges.
4. *FlexCut pressure:* This parameter determines the pressure of the Flex pressure cut length. This is usually a reduced pressure so that the knife only scratches the media or cuts it only halfway through.
5. *FlexCut Velocity:* FlexCut uses higher knife pressures. Higher knife pressures need lower cutting speed. With this parameter the velocity of FlexCut can be set independent from the normal cutting velocity.

For more info see section 3.5.

4.3.5 Panels

There are 4 specific parameters in the 'Panels' submenu:

1. *Panels:* This parameter switches panels on or off.
2. *Panel size:* This parameter determines the length of the panel.
3. *Panel replot*: This parameter determines if the design has to be cut more than once on top of itself, this per panel. Panel replot is used for thick media and media which is difficult to cut. The value of this parameter is disregarded if paneling is set to off. If this parameter is set at 0, then the cutter will cut each panel only once. If it is set at 1, it will cut each panel twice,…
4. *Sort vectors:* See paragraph below

Paneling is used for several different applications. Below are the typical settings for the most 2 common applications.

Cutting through: This is explained in section 3.5. Typical settings for the parameters are then: Panels: ON; Panel size 5 – 10cm; Panel replot: OFF; vector sorting: DIREC..

Tracking difficult media: Typical settings for the parameters are then: Panels: ON; Panel size 3 – 10cm; Panel replot: ON/OFF depending on the thickness of the media; vector sorting: DIREC./OFF depending on needed knife pressure and backing of the material.

Sort Vectors:

Sorting vectors is a sub menu of the panel menu, but because of its importance explained separately.
There are three options in this menu.

1. *Off:* When vector sorting is set of, then the cutter does no optimizing of the vectors. This is used when the intelligence of the cutter driver is preferred.
2. *Directional:* If set to directional, then the vectors are optimized for cutting direction (media movement). This used when the cutting pressure has to be set relatively high (for example with cutting through).
3. *Starting point:* This option optimizes the starting point for closed curves. This is used when the users sees that the curves do not close as they should.

4.3.6 Velocity

This menu groups all the parameters that affect the throughput of the cutter. The velocity and acceleration settings are explained in section 2.3.

4.3.7 Overcut

The Overcut submenu enables you to generate an overcut in order to facilitate weeding the cut. Each time the knife goes up or down, the cutter cuts a bit further. Figure 4.3 below shows what overcut does with a tangential knife. A sample cut-out with a drag knife would show fewer overcuts, since there would be fewer up/downs (usually only one per curve/letter).
The overcut setting can be disabled (=0) or set to any value between 0(=off) and 10. One unit is about 0.1 mm or 0.004 ".

FIG 4-3
OVERCUT

Press ENTER, then use < or > to change the value. Press ENTER to confirm or EXIT to cancel. The default overcut is set to 1.

4.3.8 OptiCut

OptiCut increases the cutting quality in case the knife is worn out or not calibrated correctly.

Press ENTER, then use < or > to set OptiCut to ON or OFF. Press ENTER to confirm or EXIT to cancel. OptiCut is default-set to OFF.

4.3.9 Emulation Lang.

The SummaCut cutters support DM-PL , HP-GL , HP-GL/2 and Auto.
DM-PL is the recommended plotting language and usually gives the best cutting quality.
HP-GL emulates an HP 7585B, 7580B, 758X Series HPGL printer.
HP-GL emulates an HP Draftmaster RX / SX / MX 7595B type printer.

Press ENTER, then use < or > to change the plotting language. Press ENTER to confirm or EXIT to cancel. The default setting is Auto.

4.3.10 USB Class

USB class can be set to Summa USB port 1, Printer Uni (unidirectional), Printer Bidi (bidirectional), Summa USB port 2, Summa USB port 3, or Summa USB port 4.
Printer Uni and Printer Bidi are for use with printer adaptors with either network or wireless connection.
Because of the different USB id's, the computer can make a distinction between several cutters attached to it (maximum 4).
Press

, then use or to change the USB Class. Press

to confirm or

to cancel. The default USB class mode is Summa USB port 1 (called standard on older machines - only this setting is compatible with older USB drivers).

NOTE: The minimum USB driver version required for attaching more than 1 cutter to the same computer is 6.2. The change in USB class becomes active only after rebooting the cutter.

NOTE: The USB id in the cutting software has to be the same as the chosen USB id in the cutter. Each time a new USB is select on the cutter and connected for the first time to the computer, the wizard for installing a driver will be started by Windows.

NOTE: Cutters with firmware revisions lower than 19 do not have the possibility to assign an id. To a USB port, so only one cutter can be connected to one computer via USB.

4.3.11 Baud Rate

The Baudrate is the speed at which the data is sent from computer to cutter.
Possible settings are: 2400 bps, 4800 bps, 9600 bps, 19200, 38400 and 57600 bps.

NOTE: If the cutter's Baud rate setting does not match the Baudrate settings of the computer, then computer and cutter will not communicate.

Press

, then use or to change the Baudrate. Press

to confirm or

to cancel.
The Baudrate is default set at 9600 (this is the Windows default setting for a serial port).

4.3.12 Parity

The PARITY submenu is used to set or modify the byte format and parity type for serial communications between the cutter and the host computer.
There is the choice between None, Mark, Even, and Odd.

NOTE: If the cutter's parity setting does not match the setting of the computer, then communication between cutter and computer will be erratic or will not work at all, depending on the commands the cutter receives.

Press

, then use or to change. Press

to confirm or

to cancel.
The parity is default set at None.

4.3.13 RTS/DTR (RS232):

This parameter controls the "handshake" between cutter and computer.
Possible settings are Toggle or Always High.

NOTE: If the RTS/DTR setting of the cutter does not match the setting of the computer, then communication between cutter and computer will not work when large packets of data are sent from computer to the cutter. A typical fault in this setting is a job that begins without any problem and then suddenly stray lines are cut out (or drawn).

Press

, then use or to change. Press

to confirm or

to cancel.
RTS/DTR is default set to Toggle.

4.3.14 RS232 TEST

The RS232 test routine verifies the cutter's RS-232-C serial communications (transmit data, receive data, and hardware handshaking) circuits. This test does not require pen, knife, or media to be loaded.

To run the RS-232-C test, proceed as follows:

1. Unplug the RS-232-C data cable from the rear panel of the cutter.
2. Use a loop back test cable to connect pin 2 of the cutter's data connector to pin 3 and pin 7 to pin 8.
3. Press

The cutter will start transmitting and receiving data at all available baud rates and parity settings. The length of the transmissions will vary because of the different baud rates used. The unit then checks the hardware handshake lines. Afterwards it will report on the LCD whether it passed the test or not.
4. Upon completion of the test, remove the loop back test cable from the cutter's rear panel RS-232-C connector.
5. Plug the RS-232-C data cable into the connector.

4.3.15 Alignment Mode

The OPOS settings are explained in detail in section 3, except for the Alignment mode. There are three additional alignment methods available on all SummaCut cutters: X-Alignment, XY-Alignment and XY-Adjustment.
These alignment methods can be used if the combination of marker color – media color cannot be read by the OPOS sensor.

These alignment methods require that the user manually register markers using the cutter's keypad. Most cutting software can automatically put these markers around the printed graphic.

X-Alignment compensates for errors in media alignment, and therefore graphic rotation, by rotating the graphic's contour. This alignment method requires that the user specify the Origin and one point along the X-Axis. Distance parameters are not required. X-Alignment is the simplest alignment method.

XY-Alignment compensates for errors in graphic rotation and skew. Skew errors occur when the graphic's X and Y Axes are not perpendicular. This alignment method requires that the Origin and one point along both the X and Y Axes be specified.

XY-Adjustment compensates for errors in graphic rotation, skew, and scale. Scale errors occur when the graphic's printed size is different from the graphic's original size as created in the imaging software. X-Distance and Y-Distance parameters are required. These parameters define the distance between the Origin and X-Axis point, and between the Origin and Y-Axis point. XY-Adjustment is the most accurate manual alignment method.

Press

, then use or to change the alignment method.

Press

to confirm or

to cancel. The default alignment method is OPOS.

4.3.16 Autoload

The Autoload option enables the user to the change the vinyl unroll procedure. When autoload is on, the cutter will automatically unroll the vinyl when needed. When the autoload option is set off, the operator should manually unroll enough media before starting to cut. When autoload is set to ask, then cutter will pause after that the pinch rollers are put down. This gives the user the time to lower pinch roller pressure if necessary.
The default setting is ON. Tracking is not guaranteed when autoload is set to OFF.

Press

, then use or to activate or deactivate the autoload feature. Press

to confirm or

to cancel.
Autoload is default activated.

NOTE: Tracking is not guaranteed when autoload is set to OFF.

4.3.17 Language

This submenu is used to set or modify the dialogue language on the touch screen. When the machine is new, it asks the user to choose a language. If this setting was set to the wrong language, it can be changed with this option.
The information on the touch screen can be displayed in English, French, German, Spanish, Italian, Polish or Dutch.

Press

, then use or to set to the desired language. Press

to confirm or

to cancel.
The default language is chosen when the cutter is switched on for the first time.

4.3.18 Factory Def.

This option defaults all user parameters to factory default.

4.3.19 Copy User

This option defaults copies all the settings of User 1 to the other 3.

4.3.20 Menu Units

The setting of these options determines whether the speed and size values are displayed in the metric measure system or ENG/US measure system.

Press

, then use or to set to the desired measure system Press

to confirm or

to cancel.
The panel units are chosen when the cutter is switched on for the first time.

4.3.21 ROM Revision

Press the button to view information about the cutter's ROM revision. This information is often helpful to technicians when diagnosing problems over the telephone.

4.3.22 Recut offset:

The **Recut offset** submenu is used to set or modify the distances between the jobs when making multiple recuts.

Press ENTER, then use < or > to change the Baudrate. Press ENTER to confirm or EXIT to cancel. The default value is 40mm.

4.3.23 Media Sensor

The media sensor detects whether media is loaded and also detect the end of the media. The sensor prevents damage to the cutting strip and knife tip. The sensor can be activated or deactivated with this menu.
The cutter will stop, during the loading procedure or while it is cutting, if the rear sensor detects the end of the media.

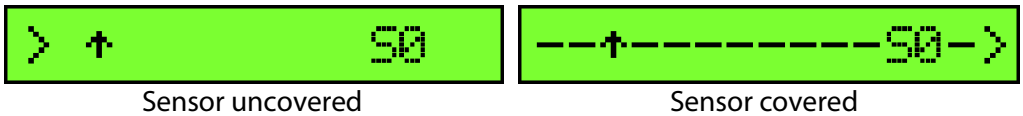
Press ENTER, then use < or > to activate (ON) or deactivate (OFF). Press ENTER to confirm or EXIT to cancel.
The default setting for the media sensor is ON.

4.3.24 Sensor Setup

The media sensor setup option is a useful routine for checking whether the media sensor is functioning properly and whether the switching levels of the sensor is correctly set.

1. Press ENTER.
2. Put a piece of media half on the sensor and under the two outer pinch rollers and press ENTER.
3. There are five levels of sensitivity to choose from, use < or > to change the sensitivity level

After choosing a sensitivity level, the S value will change on the LCD. When the sensor is covered then the length of the arrow will reach (completely) at the right side of the LCD. When the senor is uncovered, then the length of the arrow will be (almost) 0.



Sensor uncovered Sensor covered

FIG 4-4
SENSOR SETUP

The black arrow pointing upwards on the LCD is the trigger level at which the cutter decides whether there is media in the machine or not.

4. Use or to change the trigger level if necessary.

Ideally there would be 1 or 2 spaces between arrow pointing sideways and arrow pointing upwards when the sensor is uncovered, the arrow reaching completely to the right when it is covered.

4.3.25 Calibrate XY

Length calibration allows the length of the lines cut to be adjusted to within the specifications.
For instance, if a cut line should measure 100 mm exactly, the cutter can be adjusted for any discrepancy.
Calibration is explained in section 2.5.

4.3.26 Coil Setup

This test is used to calibrate knife and pen pressure and to set the knife and pen "landing."
The cut quality is seriously affected by incorrect landing settings. Before changing these values, write them down, as there is no default setting for these parameters.
After adjustment, the value is saved in the system's non-volatile RAM.

Press the button, then use or to switch between the parameters and use or to change the value of the current chosen parameter.

Press to confirm or to cancel.

Setting 40g pressure and 400g pressure.

To execute this test, a tension gauge of ± 100 gr and ± 600 gr is required.
Measure the pressure on the knife with the tension gauge (read value from the gauge when knife just lifts from the media.) Use or to change the value of the parameter so that the readout on the tension gauge matches the value on the LCD (40g or 400g depending on the parameter that is calibrated).

Setting the landing

The landing determines, among other things, the force at which the tool hits the media. When calibrating the landing, the tool holder with the knife must be inserted in the head. Be sure that the knife does not protrude.

Use to lower the landing value until the tool is in the "up" position. Then use to raise the value of the parameter. With each unit of change, continue checking if the tool is completely down yet. Once the tool is completely down, raise the value back up two units, and this becomes the proper setting.

4.3.27 Cal. Media

Media calibration ensures that the sensor is able to recognize the markers. This is explained in section 3.2.2

4.3.28 Cal. OPOS

This test calibrates the physical distance between the OPOS sensor and the knife tip. It is explained in section 3.2.1

4.3.29 OPOS Parameters

The OPOS settings sub-menu is used to change the different OPOS parameters with the control panel. It is explained in section 3.3.5

Extra parameters are:

Sheet mode
Is explained in section 3.4.3

OPOS Panelling
With this option, the markers can be read in panels. The OPOS sensor will read markers according to panel size, instead of loading them all be.
OPOS Panels can be set to OFF or ON. When set to ON, then the sensor will load only 2 markers in X-direction when loading OPOS. Other markers will be read when unrolling media.
The panel size will be set automatically to the distance between two markers in the X direction.

OPOS Origin
These settings are explained in section 3.4.1

4.3.30 OPOS Sensor

This submenu is to test the reflection value of OPOS. Press

for readout.

5 Maintenance and Cleaning

5.1 Introduction

The SummaCut cutter range has a number of sliding surfaces made of smooth metals and plastics. They are virtually friction-free and require no lubrication. They will, however, collect dust and lint that may affect the cutter's performance. Keep the cutter as clean as possible by using a dust cover. When necessary, clean the unit with a soft cloth dampened with isopropyl alcohol or mild detergent. Do not use abrasives.

5.1.1 Cleaning the drive system

Over time, the sleeves of the drive drum may become clogged with accumulated residue from the media liner. This may cause the media to slip between the pinch rollers and the drive sleeves, decreasing traction.

Cleaning the drive system:

1. Make sure there is no media loaded in the cutter.
2. Switch cutter off and disconnect the cutter from the mains. Raise the pinch rollers.
3. Put a pinch roller above the sleeve that needs to be cleaned. Make sure it is the outer left or the outer right pinch roller (otherwise there is not enough pressure).
4. Remove the backing from a piece of vinyl. Place the piece of vinyl between a pinch roller and drive sleeve with the tacky side down. Lower pinch roller.
5. Turn on another yellow drive sleeve by hand so that the piece of vinyl is winding on the sleeve for at least one turn.
6. Then pull the piece of vinyl from underneath the pinch roller.
7. Repeat several times until all residue is removed from the drive sleeves.

FIG 5-1
PLACEMENT OF VINYL STRIP

5.1.2 Cleaning the media sensor

Over time, the media sensor may become dirty with accumulated residue from the media. This may cause the cutter to malfunction.

Clean the media sensor by wiping them out with cotton swabs.

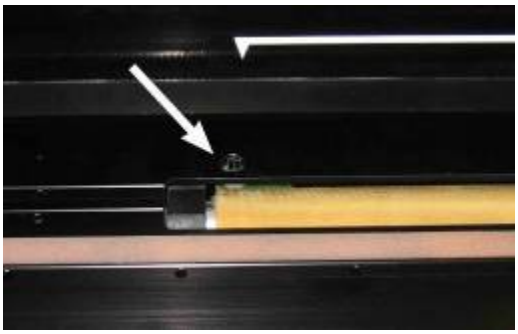


FIG 5-2
MEDIA SENSOR SUMMACUT CUTTERS

5.1.3 Cleaning the Y-Guide Rail

There are 2 V-shaped areas on the Y-guide rail on which the tools carriage slides from left to right. The areas are on top and on the bottom of the front of the Y guiding.
Even though the shape of the Y-guide rail may differ from model to model, the areas are located in the same place at the top and bottom of the guiding.
The figure below shows the top of the Y guiding.

FIG 5-3
SLIDING SURFACES ON Y-GUIDE RAIL

Over time, there may be some accumulated residue on these sliding surfaces and on the rollers of the tool carriage.

Cleaning the sliding surfaces of the Y-Guide rail:

1. Switch machine off.
2. Take a soft cloth dampened with isopropyl alcohol or mild detergent.
3. Clean surfaces; when the tool carriage is in the way, push it gently to the left or right.

5.1.4 Changing the fuse

CAUTION: Before changing the fuse, make sure that the cutter is completely disconnected from its power source.

CAUTION: For continued protection against risk of fire, replace only with the same type and rating of fuse: T2.0A, 250V SCHURTER SPT OR EQUIVALENT.

1. To remove the fuse (3), lightly pry the fuse holder release clip (2) in the direction opposite the power switch. The fuse holder will pop free.

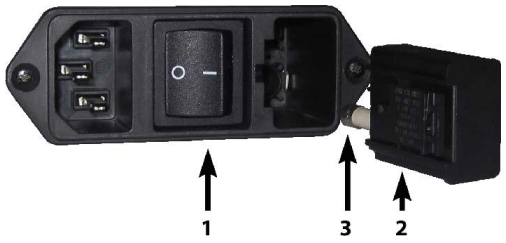


FIG 5-4
POWER ENTRY MODULE

2. Remove the fuse holder.
3. Pull the fuse from the holder.
4. Put new fuse in the holder and clip the holder back into place.

6 Specs and General Information

6.1 Models

The SummaCut series are available in different sizes and different configurations. Depending on the region, certain sizes and or configurations may not be available. Also branding may be different. In this section we refer to the basic model names D60, D75, D120, D140 and D160. Where known, it is marked if a specification is configuration depended.

6.2 Features List

6.2.1 Hardware

- Integrated roll feed system with media flanges
- Fully adjustable media widths. (not on the FX-Series)
- Stand with basket (Optional on D60 and D75).
- Back Media sensor
- OPOS
  - With barcode recognition
  - OPOS X sensor automatically raised and lowered.

6.2.2 Interface

- 8-key control panel.
- 16-character liquid crystal display.
- English, Spanish, French, German, Italian, Dutch, Portuguese, Polish,
- Metric or English units.

6.2.3 Functionality

- Four separate user configurations stored in the non-volatile memory.
- Automatic media pull from roll.
- Concatenation and curve smoothing to obtain better cut quality.
- OptiCut drag-movement optimization.
- Overcut for easy weeding.
- FlexCut, Paneling, Vector Sorting.
- Multiple recut feature (up to 999).
- Flash EPROM's

6.2.4 Software

- WinPlot
  - "Bridge" program to cut artwork created in other programs.
  - Windows 2000,XP, Vista and Windows 7
  - Connection by USB, serial, parallel or any printer port installed on operating system
  - Connection by IP address.
  - Import of simple AI, EPS and DXF files
  - Plug-in for CorelDraw 12 -> X6, for Adobe Illustrator CS -> CS6
  - Nesting, paneling, weeding box and cut by color possibilities
  - Integration of OPOS

- MacSign™ Cut
  - "Bridge" program to cut artwork created in other programs.
  - Mac OS 9 & Mac OSX (10.2 or higher)
  - Import artworks from Illustrator, Freehand, Canvas, CorelDraw,…
  - Connection by USB
  - Resizing positioning, mirroring, …
  - Registration required

- Summa Cutter Control
  - Program to control cutter parameters.
  - Utility to upgrade firmware
  - Possibility to store user configurations on hard disk
  - Windows 2000,XP, Vista and Windows 7
  - OPOS Barcode Server

6.2.5 CUTTER ACCESSORIES AND CONSUMABLES

The following accessories and consumables are available for your SummaCut cutter:

Manual and driver CD User's English, German, French, Spanish, Italian and Dutch	MD9045	Included
Power Supply Cables	MC1184 (Europe) MC3545 (US)	1x
Serial Cable	423-183	-
USB Cable	399-111	1x
Standard knife (set of 5x)	391-360	2 knives
Standard knife holder	391-332	1x
Sandblast knife (set of 5x)	391-358	-
Sandblast knife holder	391-363	-
Fibre tip pen (black) (set of 4)	MP06BK	1 pen
Rollerball pen (set of 4 :Red, Green, Blue, Yellow)	MP0646	-
Flanges for roll media (set of 2)	391-510	1 set
Manual cut-off razor blades (set of 10)	391-146	1 extra blade
Razor blade & holder	391-290	1x
Pouncing kit	391-595	-
Floor Stand D60(SE)	399-050	-
Floor Stand with Basket D60(SE)	399-075	-

TABLE 1:
ACCESSORIES AND CONSUMABLES

6.3 Technical Specification

6.3.1 Machine dimensions

	D60		D75		D120		D140		D160	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Height	300	11.8	300	11.8	1120	44.1	1145	45.1	1145	45.1
Width	1000	39.4	1150	45.3	1600	63.0	1750	68.9	1980	77.9
Depth	350	13.8	350	13.8	680	26.8	680	26.8	680	26.8
Weight	15 kg	33 lbs	17 kg	37 lbs	42 kg	92 lbs	48 kg	106 lbs	54 kg	119 lbs

TABLE 2:
MACHINE DIMENSIONS

6.3.2 Shipping dimensions

	D60		D75		D120		D140		D160	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Height	470	18.5	470	18.5	670	26.4	670	26.4	670	26.4
Width	1130	44.5	1280	50.4	1740	68.5	1880	74.0	2110	83.1
Depth	470	18.5	470	18.5	480	18.9	480	18.9	480	18.9
Weight	23 kg	51 lbs	27 kg	59 lbs	57 kg	125 lbs	69 kg	152 lbs	78 kg	172 lbs

TABLE 3:
SHIPPING DIMENSIONS

6.3.3 Media

	D60[4]		D75		D120		D140		D160	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Media Width Minimum	70	2.8	70	2.8	120	4.7	180	7.1	180	7.1
Maximum	660	26.0	710	28.0	1260	49.6	1410	55.5	1635	64.4
Pinchrollers	2		2		3		4		4	
Max .working Width	600	23.6	750	29.5	1200	47.2	1350	53.1	1575	62
Oversized[3]	630	24.8	780	30.7	1230	48.4	1380	54.3	1605	63.2

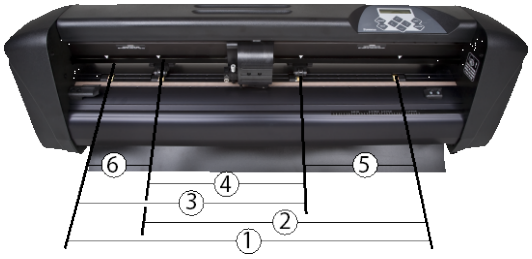
	mm	Inch
Max.Working Length	50m	164ft.
Minimum Margins[2]	25	1
Front margin	18	0.7
Rear margin Sensor on	42	1.7
Sensor off	25	1
Tracking performance [3]	-8 m/26 feet max. within guaranteed specifications[1] for media less than 762 mm (30'' wide). -4m/13 feet max. within guaranteed specifications[1] for media larger than 762 mm (30'' wide).	
Thickness	0.05 to 0.25 / 0.8mm with optional sandblast knife 0.002 to 0.01 / 0.03 inch with optional sandblast knife	

(1) Larger Media lengths can be handled, but compliance with specifications is not guaranteed (will be dependent on media type, media size and other parameters not mentioned here.

(2) For positioning of the pinch rollers, these margins can be minimized using 'Oversized' mode[3]

(3) In 'Oversized' mode the tracking performance is no longer guaranteed. 'Oversized' mode is only available on D60R, D75R, D120R, D140R and D160R.

(4) The FX-Series have different media specifications as the pinchrollers can only be set in 6 positions:



Position	Min. Material Width		Max. Working Width	
	mm	Inch	mm	Inch
1.	600	23.6	575	22.6
2.	495	19.5	470	18.5
3.	400	15.7	375	14.8
4.	295	11.6	270	10.6
5.	210	8.3	190	7.5
6.*	115	4.5	95	3.7

* Media sensor should be disabled in order to use this position.

TABLE 4:
SUMMACUT MEDIA SPECIFICATIONS

6.3.4 PERFORMANCE

Cutting specifications on 0.05 mm (0.002") wax-backed vinyl, total media thickness not greater than 0.25 mm (0.010")

Axial speed	50 to 800 mm/s	2 to 32 ips
Maximum Speed	Up to 1131 mm/s diagonal	Up to 44 ips diagonal
Default speed	700 mm/s	28 ips
Axial Acceleration	up to 2 G	
Max. Acceleration	up to 3 G diagonal	
Addressable resolution	0.025 mm, 0.1 mm	0.001", 0.005"
Default resolution	0.025 mm	0.001"
Mechanical resolution	0.0127 mm	0.0005"
Repeatability*	+/- 0.1mm	+/- 0.004"
Accuracy*	0.2% of move or 0.25 mm, whichever is greater**	0.2% of move or 0.010", whichever is greater**
Knife pressure	0 to 400 gr.	
Pen pressure	0 to 400 gr.	
Pouncing pressure	0 to 250 gr.	

*Valid within the guaranteed tracking length (see table 3). Not valid in 'Oversized' Mode.

**Excludes differences due to media expansion, stretching, etc.

TABLE 5:
SUMMACUT PERFORMANCES

6.3.5 INTERFACE

Communication	Standard asynchronous RS-232-C and Universal Serial Bus .
Serial : I/O Port connector	DB-9P
Mating connector	DB-9S
Byte format	8 data bits, 2 stop bits, no parity
Baud rate	57600, 38400, 19200, 9600, 4800, 2400 bps
USB : I/O Port connector	USB series "B" receptacle
Mating connector	USB series "B" plug
Buffer Size	16 MB

TABLE 6:
SUMMACUT INTERFACE SPECIFICATIONS

6.3.6 FIRMWARE

Language	DM/PL, HP-GL (758x emulation), HP-GL/2
Supported character sets	Standard ASCII
Supported fonts	Sans serif (single stroke & medium)
ROM-based plots	Confidence plot, DIN plot

TABLE 7:
SUMMACUT FIRMWARE

6.3.7 ENVIRONMENTAL

(Cutter without media)

Operating Temperature	15 to 35° C	59 to 95° F
Storage temperature	-30 to 70° C	-22 to 158° F
Relative humidity	35 - 75 %, non condensing	35 - 75 %, non condensing

TABLE 9:
SUMMACUT ENVIRONMENTAL SPECIFICATIONS

IMPORTANT HINT

The use of dimensionally stable media is an essential pre-requisite to obtaining high cut quality. Additionally, media expansion or contraction may occur as a result of temperature variations.
To improve the dimensional stability of media, let it stabilize to the current environmental conditions before usage for a minimum period of 24 hours
.

6.3.8 Electrical

The power entry module detects the line voltage and switches automatically between 110V and 230V.

Main Supply: 48-62 Hz, single phase.

Nominal line	Min./Max. line	Fuse
110 V AC	88 - 132 V AC	T2.0A, 250V Schurter SPT or equivalent.
230 V AC	176 - 264 V AC	T2.0A, 250V SCHURTER SPT OR EQUIVALENT.

TABLE 10:
SUMMACUT ELECTRICAL SPECIFICATIONS

Power requirements: 100-120 / 220-240 VAC, 50/60 Hz, 85 VA maximum

6.3.9 Certifications

CE-Certification for electrical light industrial environment.
FCC Class A
Conforms to ANSI/UL Standard 60950-1
and certified to CAN/CSA Standard C22.2 No 60950-1**..**

6.4 Cutter accessories and consumables

The chart following contains descriptions and part numbers for the SummaCut accessories.

Part description	Part number	Picture
Manual and driver CD	**MD9045**	
Power cable (Regional differences, contact local dealer for exact part number)		
USB cable	**399-111**	
Serial cable	**423-183**	
Media flanges (set of 2)	**391-510**	
Standard drag knife holder	**391-332**	
Razor blade (set of 10)	**391-146**	
Drag knife 60° up to 0.6 mm cutting depth	**391-231**	
Standard drag knife (set of 5)	**391-360**	

Sandblast drag knife (set of 5)	**391-358**	
Plotter pen (set of 4)	**MP06BK**	
Drag knife holder for sandblast knife	**391-363**	
Drag pouncing pin holder	**391-595**	
Pouncing pin	**391-592**	
Fuse	**MF9003**	
Cutting strip short	**391-386**	
Cutting strip long	**400-565**	
Pouncing strip	**391-598**	

TABLE 6-1
SUMMACUT ACCESSORIES